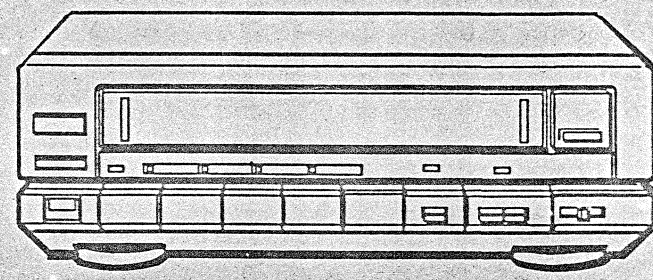
S/M Code No.90 – 098 DATE OF ISSUE 12/1990 – I

AIWA®

HV-M10 SH

SERVICE MANUAL



VIDEO CASSETTE RECORDER

• BASIC VIDEO MECHANISM : TN – 5900 • TYPE. SH

SPECIFICATIONS

Recording/Playback system
Video: Rotary 2 heads helical scan system
Audio: fixed head

Video signal
PAL/MESECAM color signal, 625 lines, 50 fields
$NTSC_{3.58}$/$NTSC_{4.43}$ color signal, 525 lines, 60 fields

Recording/Playback time
4 hours max. with E-240 tape, standard speed (PAL/MESECAM)
2 hours 40 minutes max. with T-160 tape, standard speed (NTSC)

Usable cassette
VHS video cassette

Tape width
12.65 mm

Tape speed (Standard speed)
PAL/MESECAM: 23.39 mm/sec
$NTSC_{3.58}$/$NTSC_{4.43}$: 33.35 mm/sec

RF output
UHF channel between 30 and 39, PAL-K or PAL-G output

Video input
1.0 Vp-p, 75 ohms unbalanced

Video output
1.0 Vp-p, 75 ohms unbalanced

Audio input
–10 dBs, 47 kohms

Audio output
–8 dBs, 2.2 kohms

Operating temperature
5°C – 40°C

Input/output
Audio input (AUDIO IN): phono jack (1)
Audio output (AUDIO OUT): phono jack (1)
Video input (VIDEO IN): phono jack (1)
Video output (VIDEO OUT): phono jack (1)
Antenna input (AERIAL): IEC connector, 75 ohms (1)
Antenna output (RF OUT): IEC connector, 75 ohms (1)

Power requirements
110 – 240 V AC, 50/60 Hz

Power consumption
22 watts

Dimensions
270 (W) × 95 (H) × 355.5 (D) mm

Weight 4.2 kg

• Design and specifications are subject to change without notice.

AIWA Co., Ltd.

Tokyo Japan

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STANDARD MAINTENANCE

1. SERVICE SCHEDULE OF COMPONENT

○ : Check ● : Change

DECK		Periodic Service Schedule			
Ref. No.	Parts Name	1000 h	2000 h	3000 h	4000 h
2-2	UPPER DRUM	○	●	○	●
4-6	PINCH ROLLER A		●		●
3-32	CAPSTAN MOTOR ASSY		●		●
5-27	CLUTCH ASSY		●		●
4-46	LM ASSY			●	
6-22	MAIN BELT		●		●
3-5	BT BAND ASSY		●		●
5-29	DRIVE BELT		●		●
4-41	BRAKE SHOE		●		●
6-1	LOADING BELT		●		●
5-26	FL BELT		●		●
2-5	DRUM EARTH			●	
4-21	ACE HEAD HV224206			●	
3-25	REEL ASSY			●	

NOTE :

1. Clean all parts for the tape transport.
   Upper Drum with video head / Pinch Roller
   Audio Control Head
2. After cleaning up the parts, perform all DECK ADJUSTMENT.

2. CLEANING

1. CLEANING OF "VIDEO HEAD" (See Figure-1)

Head cleaning by using a chamois skin.

— Procedure —

1) Remove the "Cabinet, Steel".
2) Put on a glove (thin type) to avoid touching the "Upper drum" and "Lower drum" with bare hand.
3) Put a few drops of alcohol on the Chamois skin, and by slightly placing it against the "Head tip", allow the "Upper drum" to turn the right and left.

— Remark —

1) The video head is of very hard material, but since it is very thin, avoid cleaning it vertically.
2) Wait for the cleaned part to dry out, before operating the unit.
3) Do not reuse the Stained chamois skin.

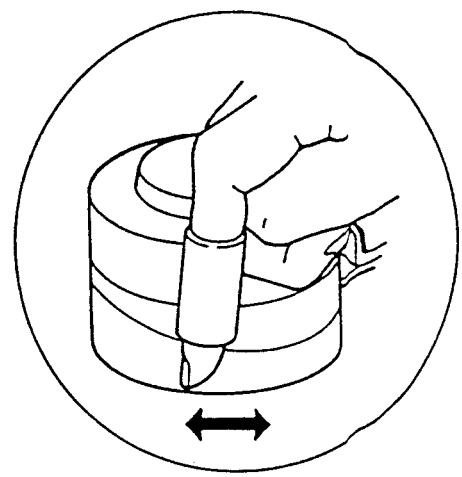


Fig-1

2. CLEANING OF "ACE HEAD" (See Figure-2)

Head cleaning by using a chamois skin.

— Procedure —

1) Remove the "Cabinet, Steel".
2) Put a few drops of alcohol on the chamois skin, clean up the "Audio control head", being careful not to damage the "Upper drum" and other tape running parts.

— Remark —

1) Avoid cleaning "ACE Head" vertically.
2) Wait for the cleaned part to dry well, before operating the unit.

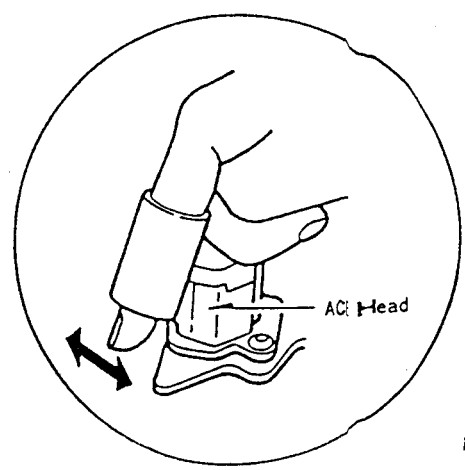
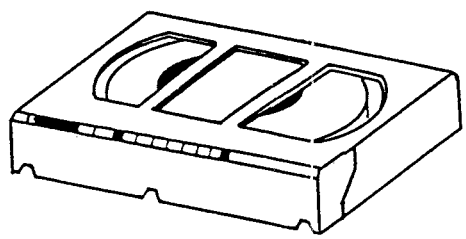


Fig-2

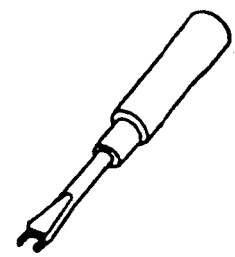
1. SERVICE JIG AND TOOLS

Ref. No.	Name	Adjustment
J-1	Torque Meter (FSC-VHT-063)	Back Tension
J-2	Special Driver (SMALL)	Tape Running Position, Envelope Wave Form
J-3	Special Driver (LARGE)	X Value
J-4	Mirror	Tape Transportation Check
J-5	Alignment Tape (TTV-P2)	X Value, Envelope Wave Form, ACE Head Azimuth
J-6	Alignment Tape (TTV-P1)	ACE Head Height / ACE Head Tilt
J-7	Box Driver M3	Tape Running Position, X Value, Envelope Wave Form
J-8	Alignment Tape (TTV-N1)	ACE Head Height/ACE Head Tilt
J-9	EXT. PCB. KIT (A) (Parts No. 09-054-012-010)	HA (For repair of circuit board)

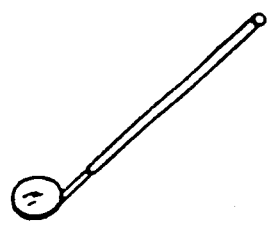
J-1, J-5, J-6, J-8



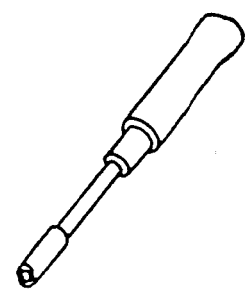
J-2, J-3



J-4



J-7



2. HOW TO ASSEMBLE THE JIGS

1. Assembling the J-9 (See Figure-1)

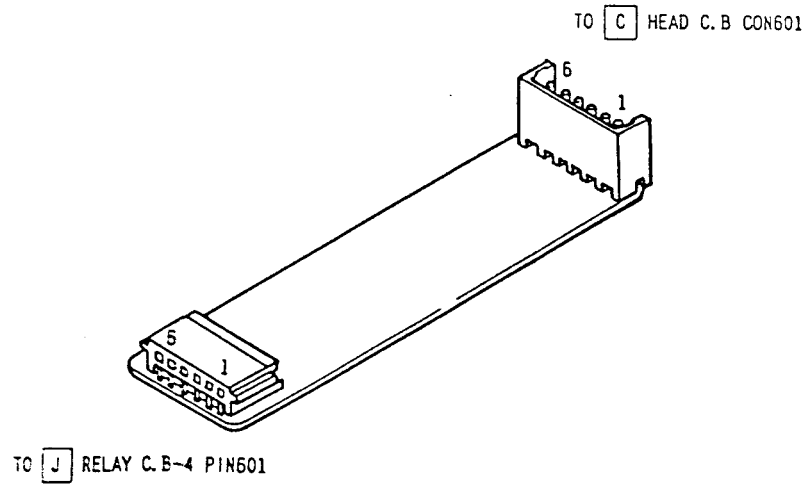


Fig-1

Place the circuit board with the solder side down as shown in the figure above and assemble the connectors, taking care of their directions.

2. Using the J-9 (See Figure-2)

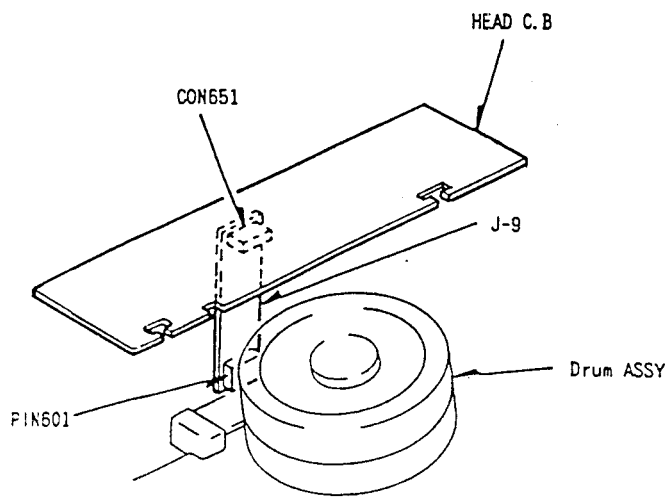


Fig-2

Use this jig when servicing the "Head circuit board".

DISASSEMBLY INSTRUCTIONS

1. "CABINET, STEEL" AND "CABINET FRONT ASSY" REMOVAL
   (See Figure-1)
   1) Remove 4 screws and the "Cabinet, steel".
   2) Release 5 hooks and remove the "Cabinet front ASSY".

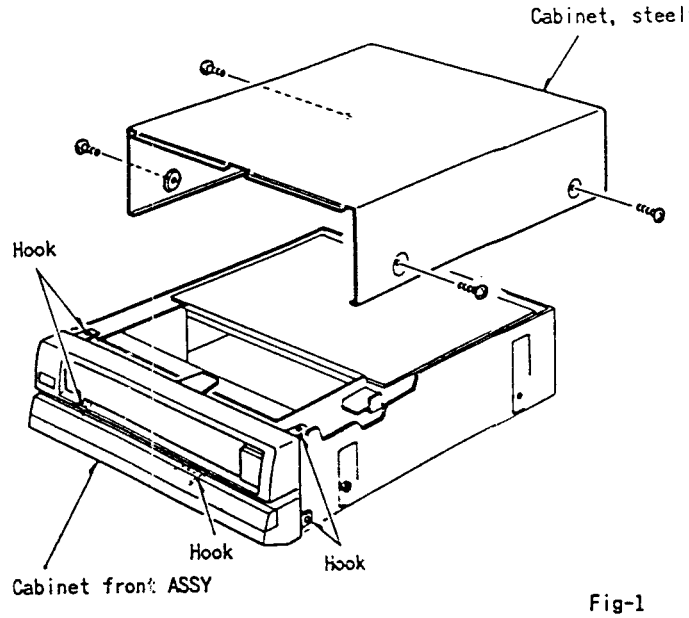


Fig-1

2. "MAIN CIRCUIT BOARD" REMOVAL (See Figure-2)
   1) Remove 5 screws and the "Main C.B".

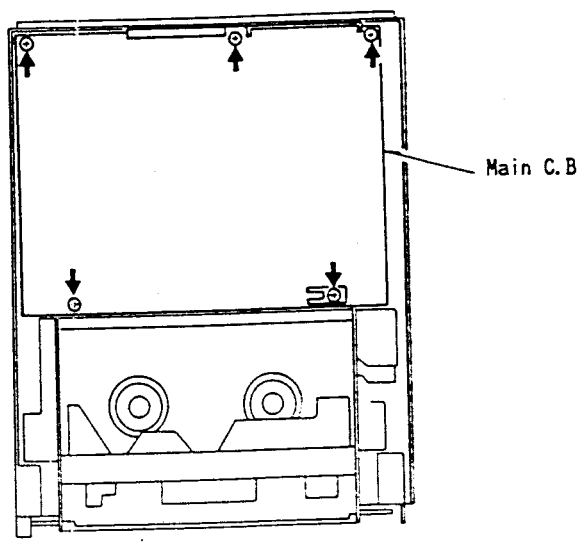


Fig-2

3. "MECHANISM ASSY" REMOVAL (See Figure-3)
   1) Remove 1 screw (A) and the "Head C.B".
   2) Remove 3 screws (B) and the "Mechanism ASSY".

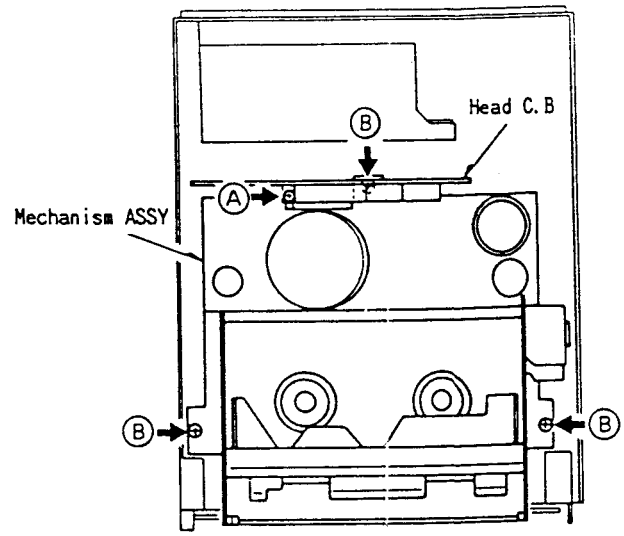


Fig-3

4. "FRONT LOADING ASSY" REMOVAL (See Figure-4)
   1) Remove "Main belt".
   2) Remove 4 screws Ⓐ.
   3) Release the hooks on both sides and remove the "Front loading ASSY". (Since it is difficult to release these hooks, hold the front of the "Front loading ASSY" and shake it up and down to release them.)

5. "CASSETTE LOAD BRACKET ASSY" REMOVAL (See Figure-4)
   1) Remove 1 screw Ⓑ.
   2) Take off the "Cassette load bracket ASSY".

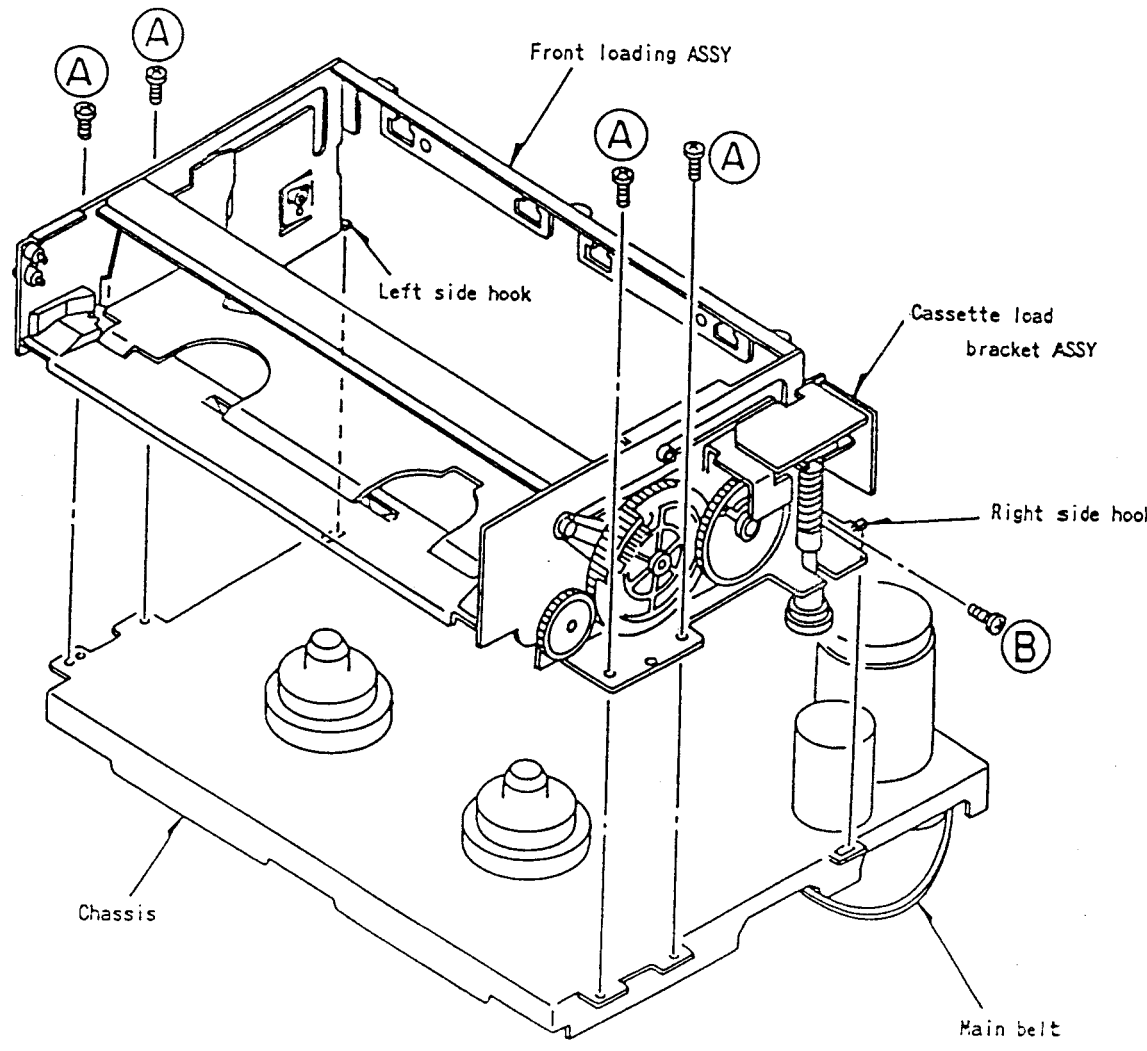


Fig-4

6. "PHOTO SENSOR ASSY" REMOVAL (See Figure-5)

1. "Lamp holder ASSY" Removal
   1) Remove 1 screw (A), and take off the "T soft brake ASSY".
      (At this time, never take off the "T-spring, soft brake arm".)
   2) Release the "Lamp holder ASSY" from hook (a) of the chassis and turn it counterclockwise to remove it from the chassis.
2. "Switch C.B", "Sensor guide" and "End sensor C.B" Removal
   1) Remove 1 screw (B) and take off the "Switch C.B".
   2) Remove 1 screw (C) and take off the "Sensor guide".
   3) Remove 1 screw (D) and take off the "End sensor C.B".
3. "Sensor guide" and "Start sensor C.B" Removal
   1) Remove 1 screw (E) and take off the "Sensor guide".
   2) Remove 1 screw (F) and take off the "Start sensor C.B".

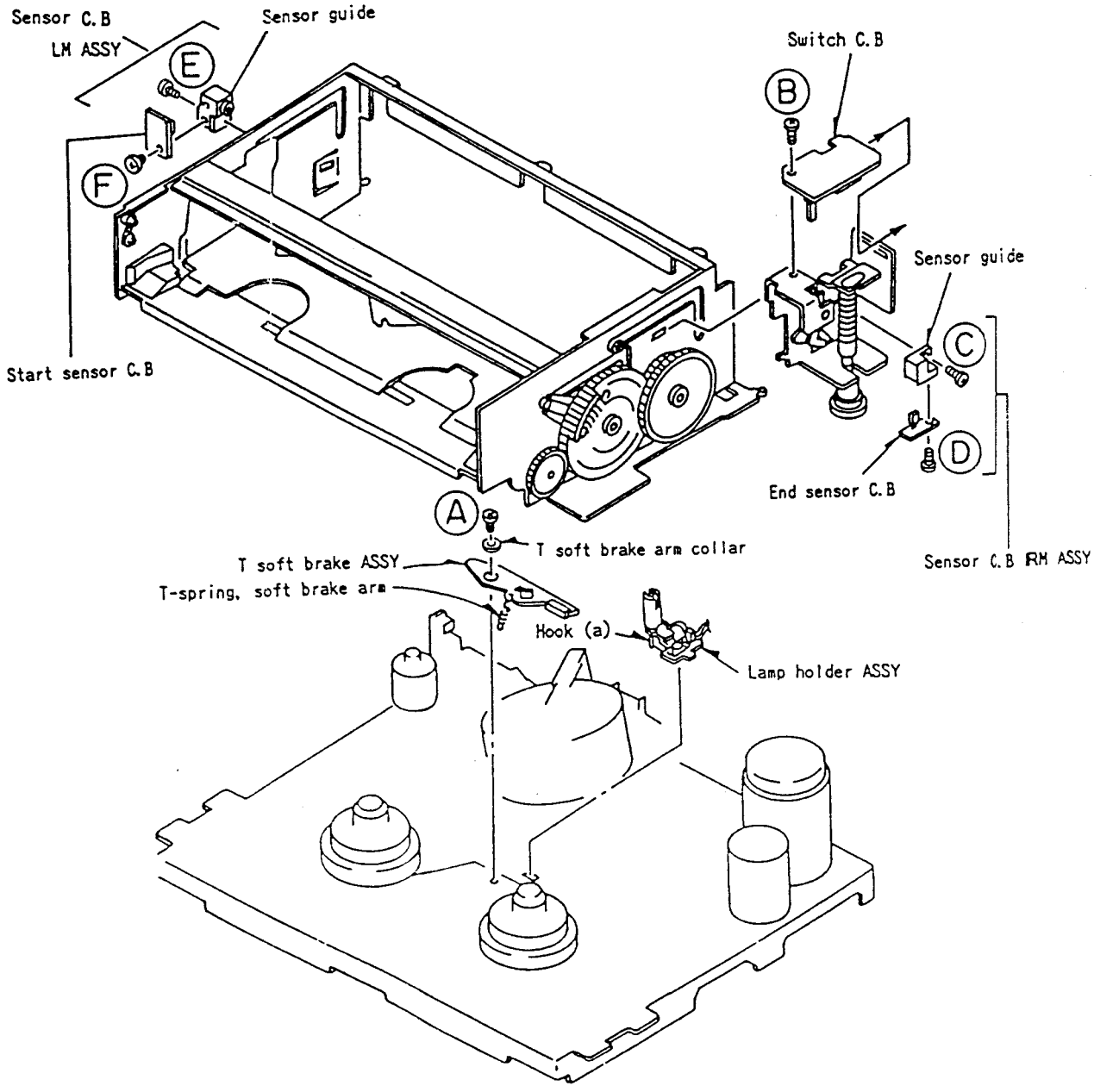


Fig-5

7. "FE PLATE" AND "ACE HEAD" REMOVAL (See Figure-6)

1. "FE plate" Removal
   1) Remove Nut (A).
   2) Take out the "Impedance roller" and pull up the "FE plate".
      (Take care not to lose parts "Impedance roller", "Impedance roller sleeve", "Tape guide frange A", "Tape guide flange spring" and "Plane washer 3×8×0.5" at the time of the "FE plate" removal.)
   3) Remove 1 screw (B) and take off the "Full erase head".
2. "ACE head" Removal
   1) Remove 3 screws ((C)×1, (D)×1, (E)×1) and "Azimuth spring".
   2) Remove "ACE head".

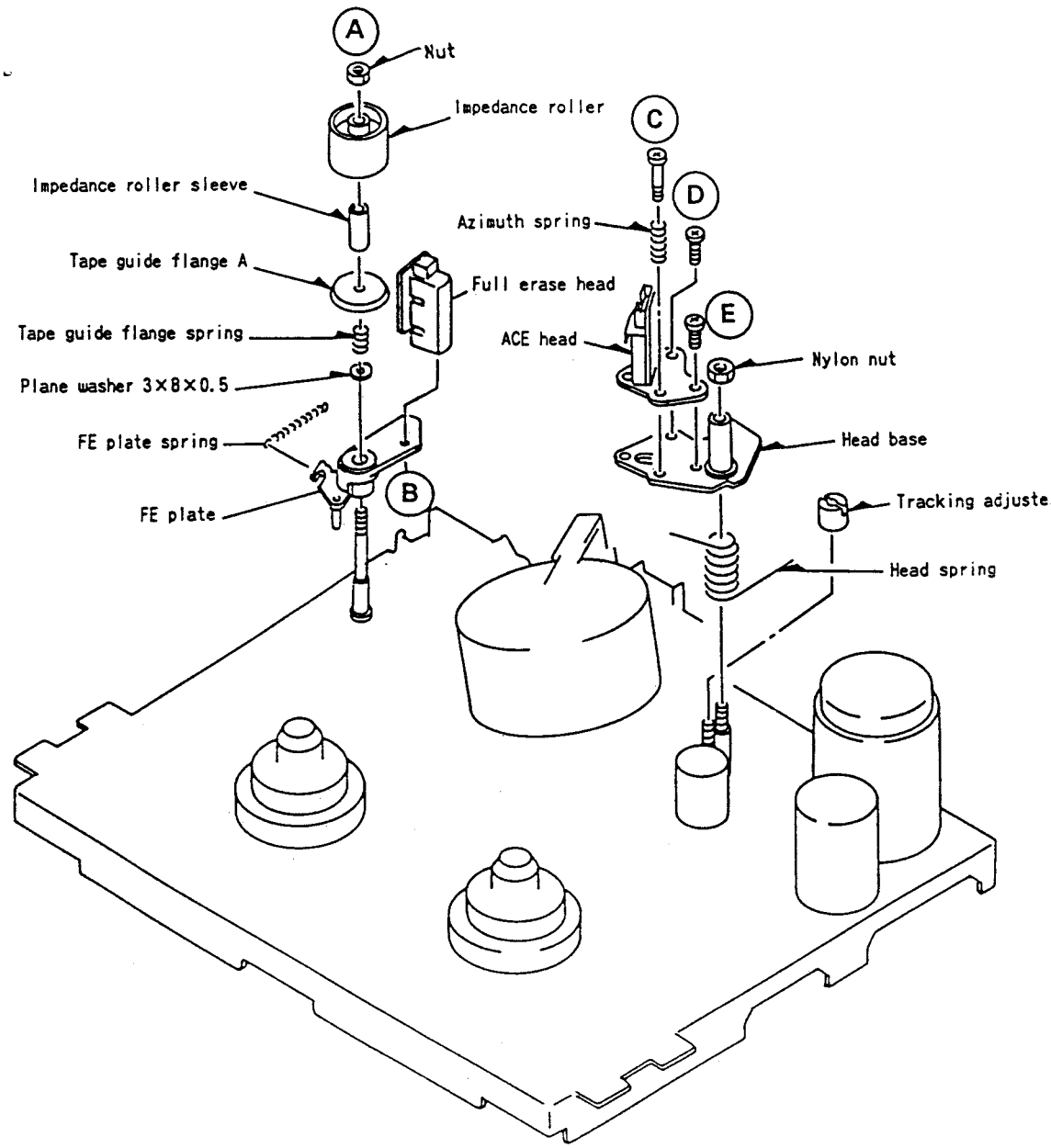


Fig-6

8. "GEAR HOLDER ASSY" REMOVAL (See Figure-7)

1) Remove the "Front loading ASSY".
2) Remove "Drive belt".
3) Remove Poly-Washer and "Middle pulley ASSY".
4) Remove Nylon-Washer (A) and take off the "Clutch ASSY".
5) Remove 1 screw (B) and 2 screws (C) and take off the "Gear holder ASSY".
6) Remove 1 screw (D) and take off the "T-spring, soft brake arm".
7) Take off the "T soft brake ASSY".
8) Remove 2 "E-Rings (E)" and take off the 2 "Reel drive gear".

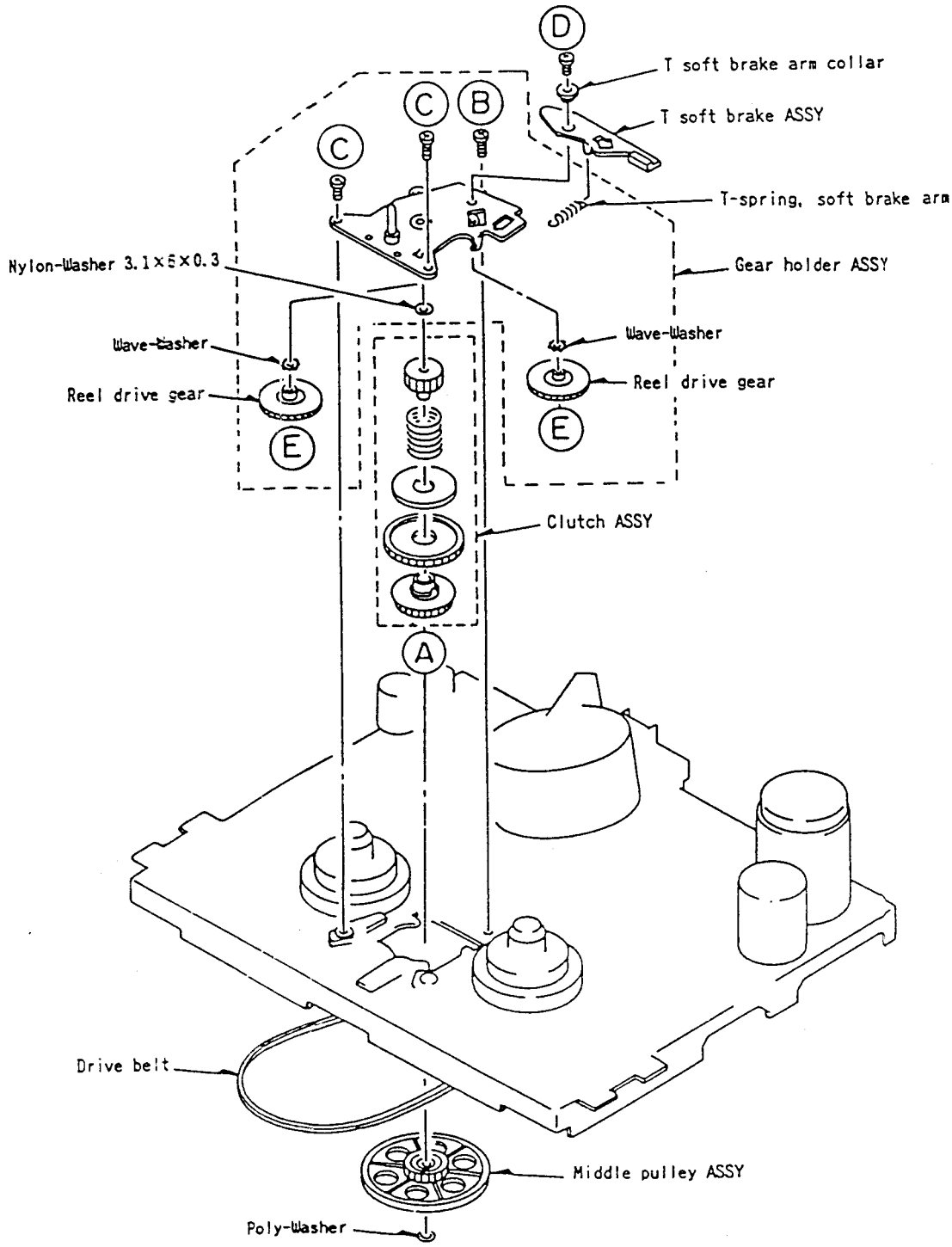


Fig-7

9. "BT BAND ASSY" and "BT ARM SEMI ASSY" REMOVAL (See Figure-8)

1) Remove the "Front loading ASSY".
2) Remove Poly-Washer (A) and "BT actuate plate spring" from the "BT arm semi ASSY".
3) Remove 1 screw (B) and "Band holder spring".
4) Take off the "BT band ASSY" from the "BT arm semi ASSY".

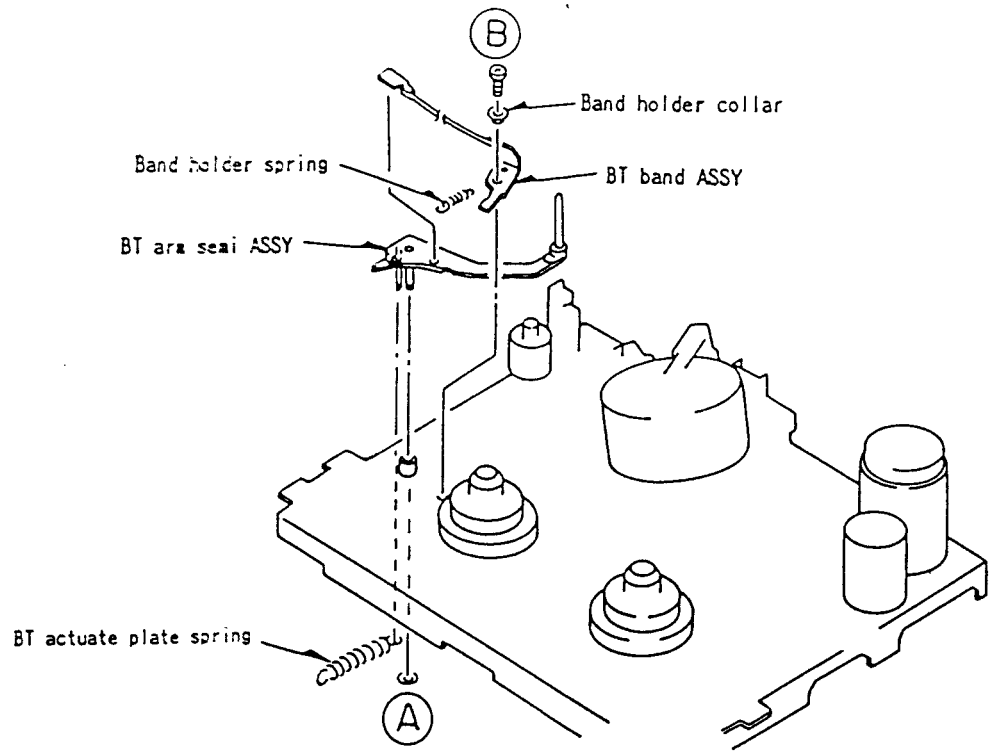


Fig-8

10. "REEL ASSY" REMOVAL (See Figure-9)

1) Remove the "Front loading ASSY", "Gear holder ASSY" and "BT band ASSY".
2) Remove 1 screw (A) and the "Back tension support".
3) Remove the 2 "Reel ASSY".

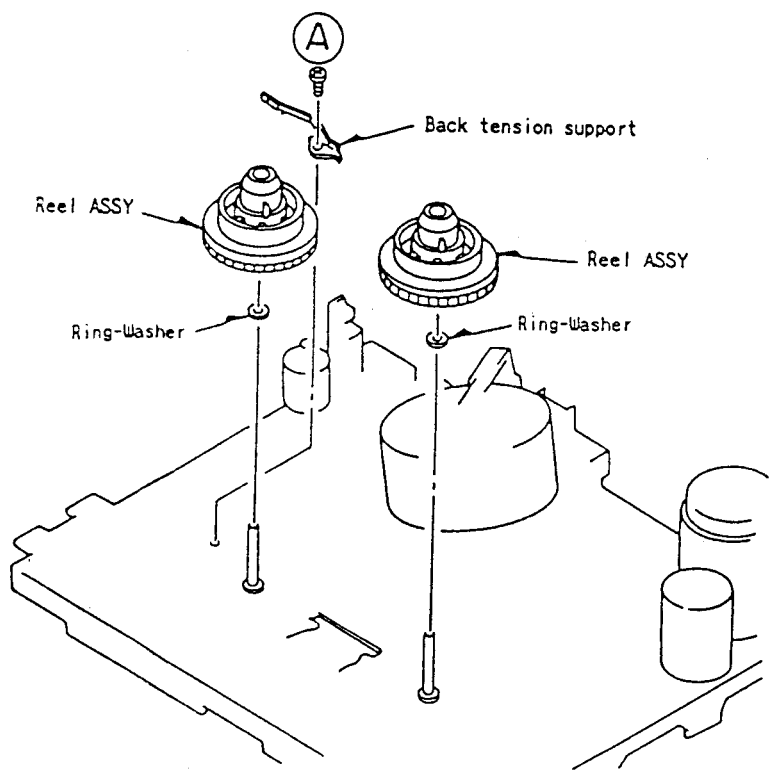


Fig-9

11. "CYLINDER ASSY" REMOVAL (See Figure-10)

1) Remove the "Front loading ASSY".
2) Pull out the "RELAY C.B-5" from the "Cylinder motor TM82".
3) Remove 1 screw (A) and take off the "Drum earth".
4) Remove 3 screws (B) and take off the "Cylinder ASSY".

≡Remarks≡

Take off the "Cylinder ASSY" carefully without any damage.

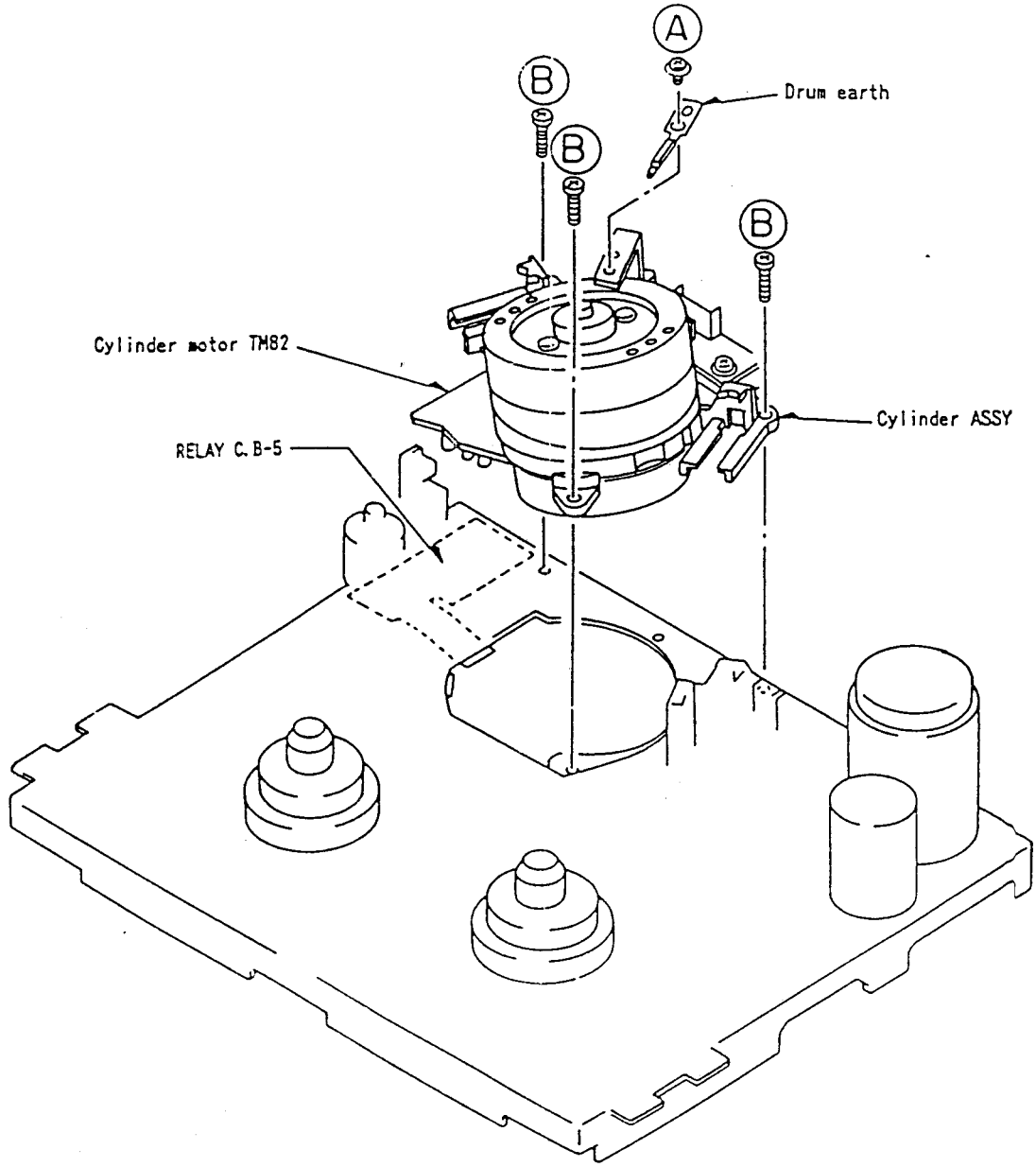
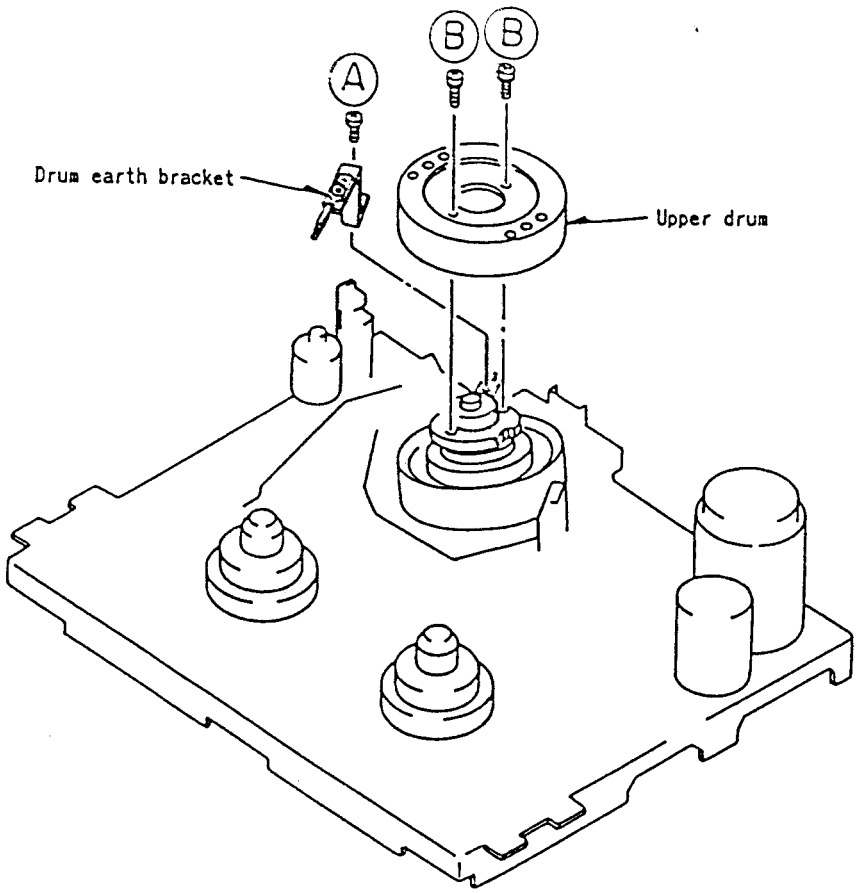


Fig-10

12. "UPPER DRUM" REMOVAL (See Figure-11)

1) Remove the "Front loading ASSY".
2) Remove 1 screw (A) and take off the "Drum earth bracket".
3) Remove 2 screws (B) and take off the "Upper drum".



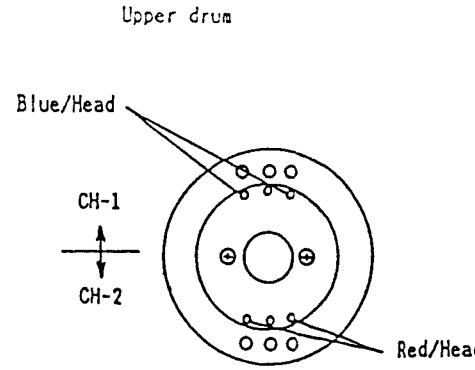


Fig-11

≡Remark≡

1. Use gloves and do not touch the drum surface with bare fingers.
2. If the Video head is defective, replace the complete "Upper drum" with the Head.
3. When installing "Upper drum" and "Rotor," Upper drum point Ⓒ , Lower Drum point Ⓓ and Rotor point Ⓔ these point Ⓒ , Ⓓ , Ⓔ mast line up each other. Other wise it will creates problem. (See Figure 11-1)

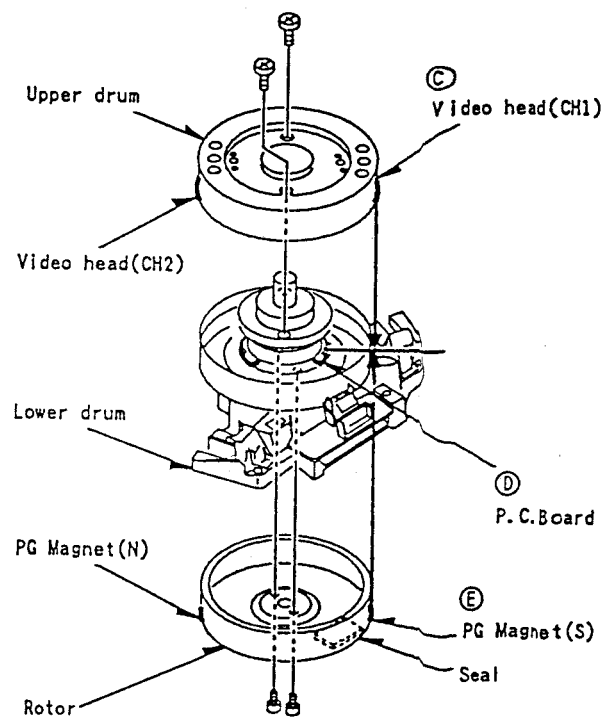


Fig-11-1

13. "CYLINDER MOTOR" REMOVAL (See Figure-12)

1) Pull out the "RELAY C.B-5" from the "Cylinder motor TM82".
2) Remove 2 screws (A) and take off the "Cylinder motor TM82".
3) Remove 3 screws (B) and take off the "Cylinder motor TM82".

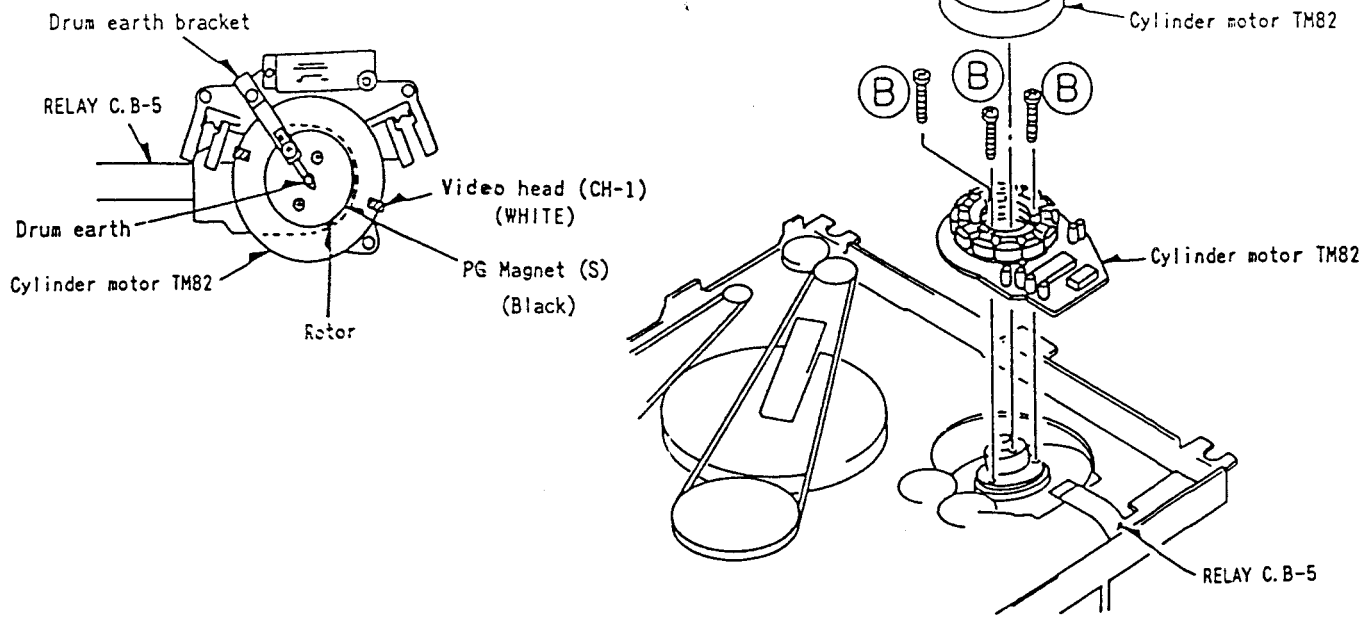


Fig-12

14. "CAPSTAN MOTOR ASSY" AND "LOADING MOTOR ASSY" REMOVAL (See Figure-13)

1. "Capstan Motor ASSY" Removal
   1) Take off the "Drive belt" and "Main belt".
   2) Remove 2 screws (A) and take off the "Capstan motor ASSY".
2. "LOADING MOTOR ASSY" Removal
   1) Take off the "FL belt".
   2) Remove 2 screws (B) and take off the "Loading motor ASSY".

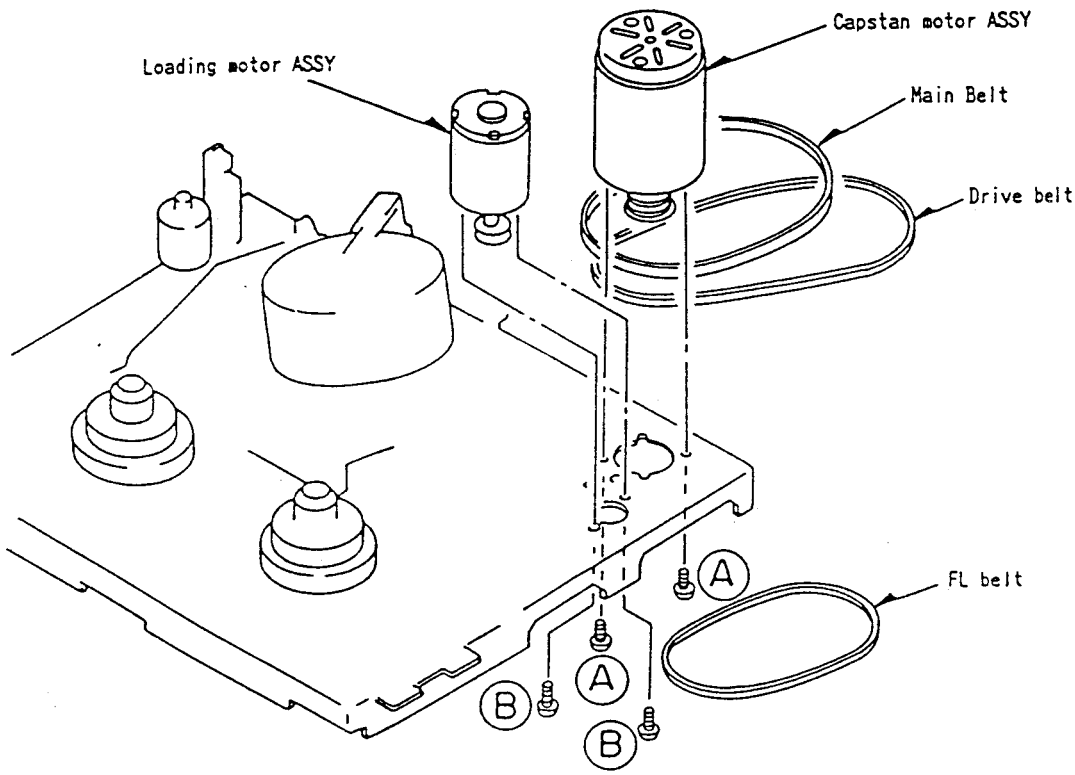


Fig-13

15. "LOADING GEAR" AND "LOADING CAM ASSY" REMOVAL (See Figure-14)

1) Take off the "Loading belt" from the "Loading pulley".
2) Remove Poly-Washer (A) and take off the "Loading pulley".
3) Remove Poly-Washer (B) and take off the "Loading gear".
4) Remove Poly-Washer (C) and take off the "Eject arm" and the "Brake actuate arm".
5) Remove 2 screws (D), and take off the "Loading lever reinforce plate" and the "Loading lever ASSY".
6) Take off the "Loading cam ASSY".

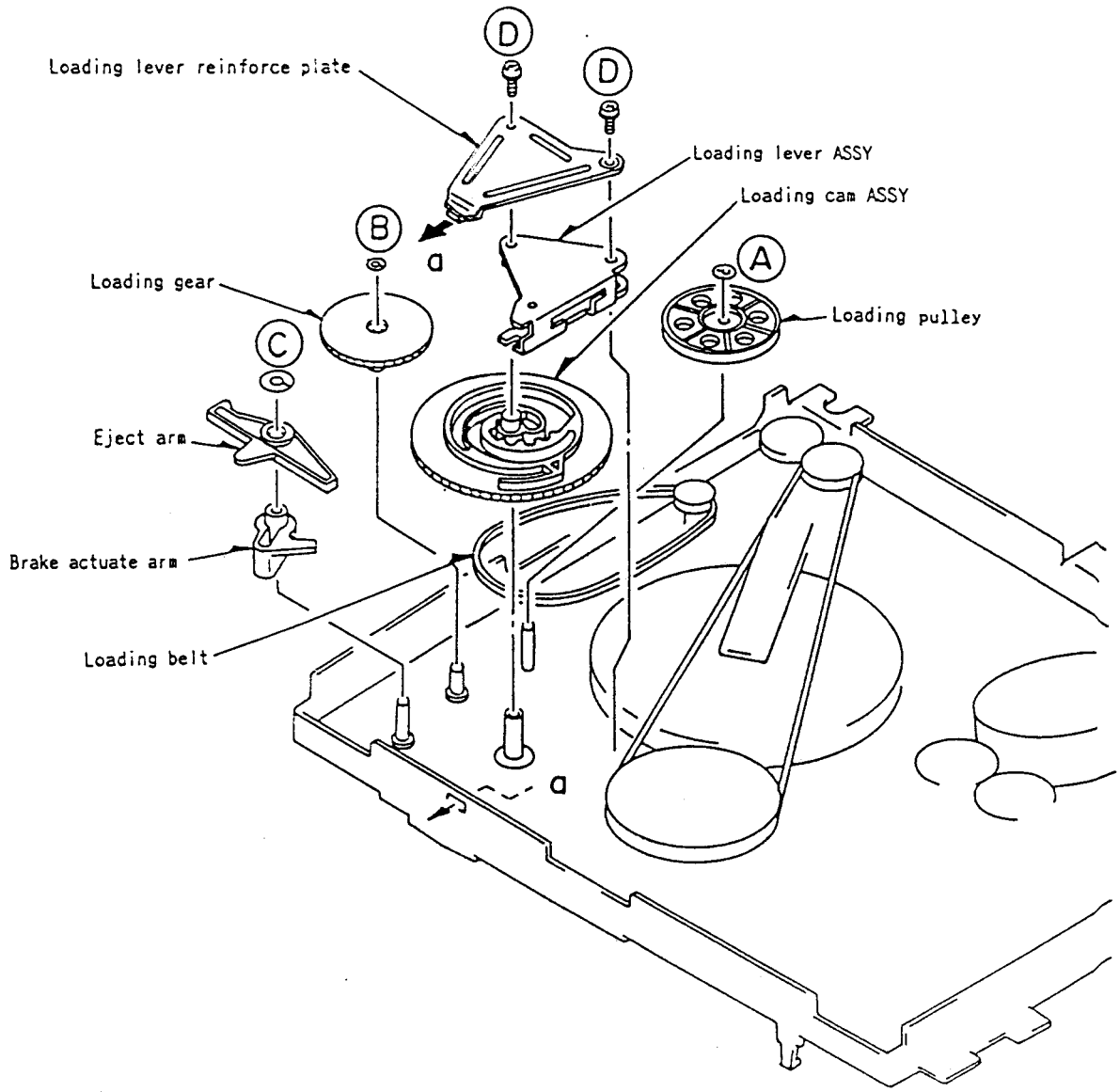


Fig-14

16. "FLYWHEEL CAPSTAN" REMOVAL (See Figure-15)

1) Remove the Nylon-Washer (A).
2) Take off the "Drive belt" and "Main belt".
3) Remove 2 screws (B) and take off the "FL angle ASSY".
4) Take off the "Flywheel capstan".

≡Remark≡

Do not miss the Poly-Washer (C) when pulling out the "Flywheel capstan".

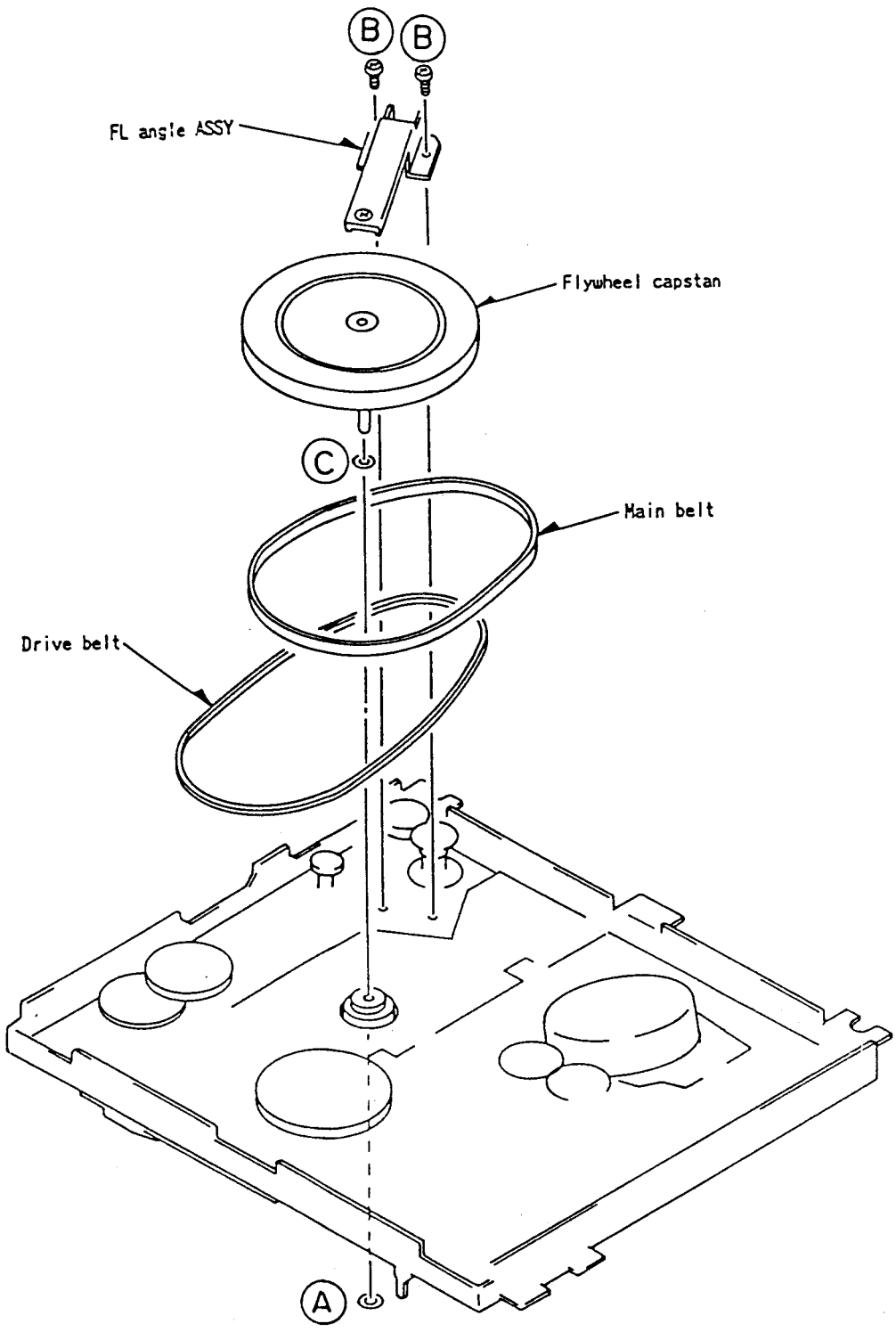


Fig-15

17. "REEL SENSOR" REMOVAL (See Figure-16)

1. Remove "Front loading ASSY" and the "Gear holder ASSY".
2. Remove "Reel ASSY".
3. Remove "Reel sensor".

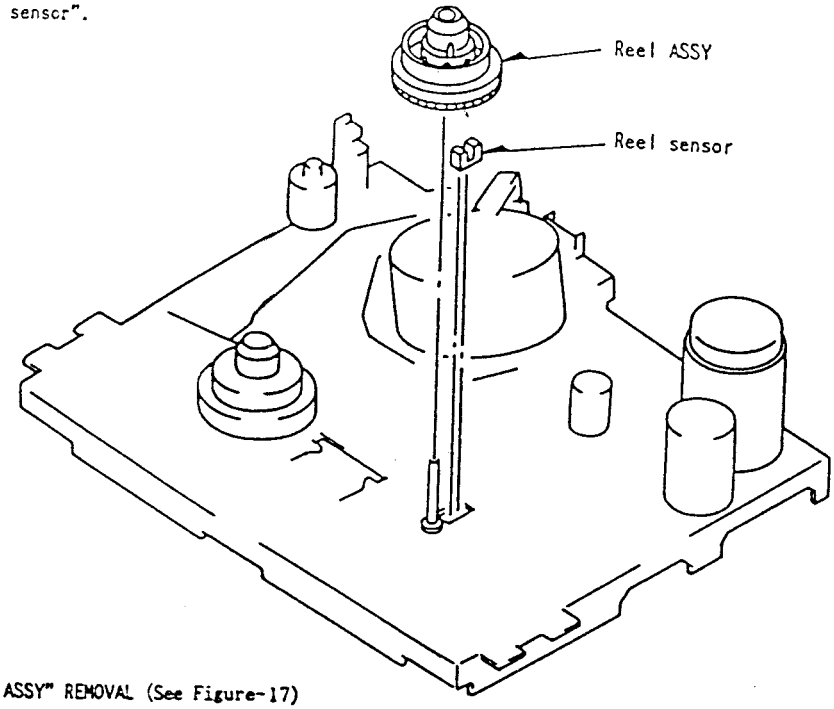


Fig-16

18. "LOADING BASE SEMI ASSY" REMOVAL (See Figure-17)

1) Remove "Cylinder ASSY", "BT arm semi ASSY", "BT band ASSY" and "Front loading ASSY".
2) Remove 1 screw (A) and "L gear plate collar", "L gear plate".
3) Remove 2 screws (B).
4) Take off the "Loading base semi ASSY".

≡Remark≡

When installing the "L gear plate", align markings (C) on the "T loading gear L" and "L gear plate".

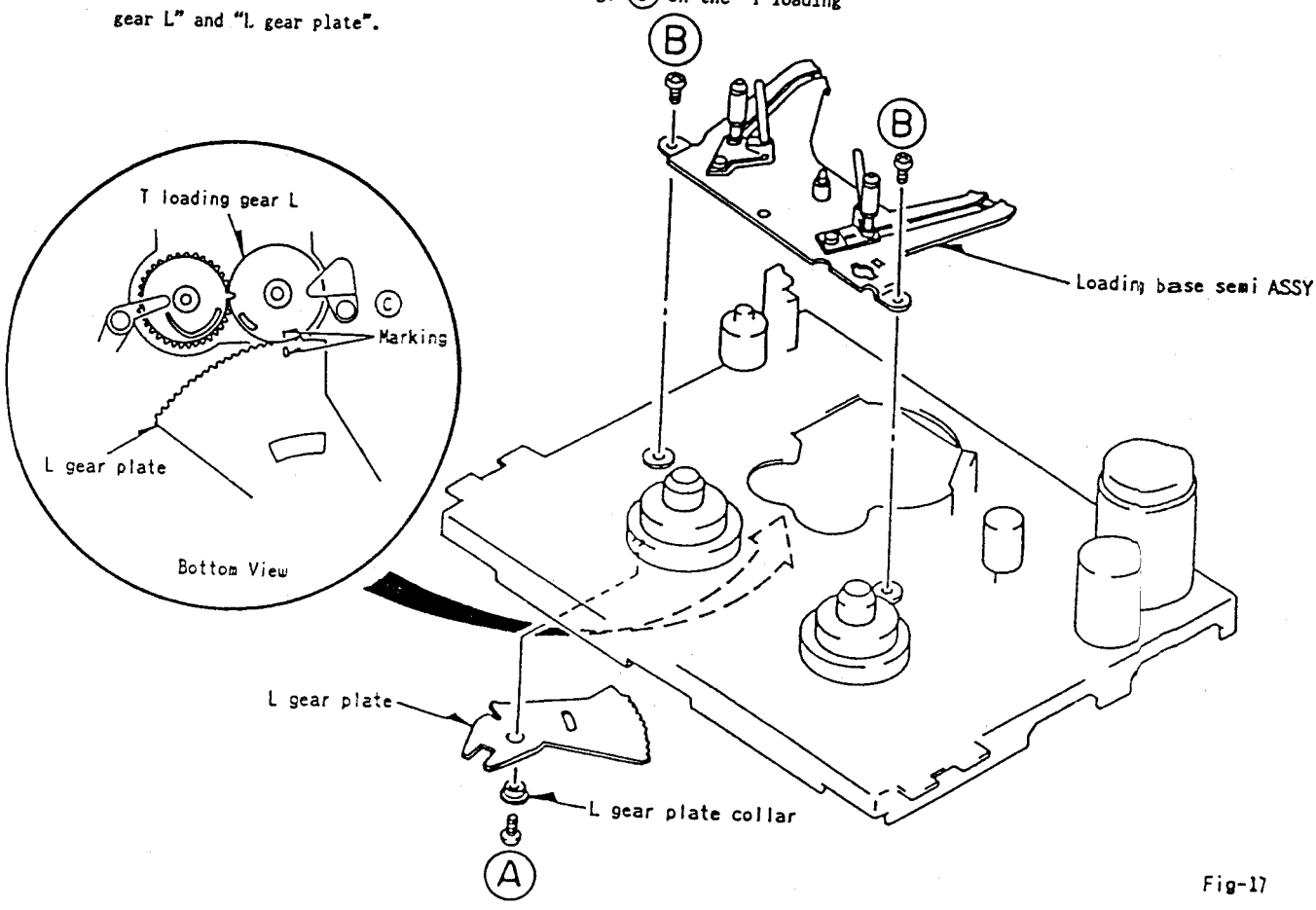


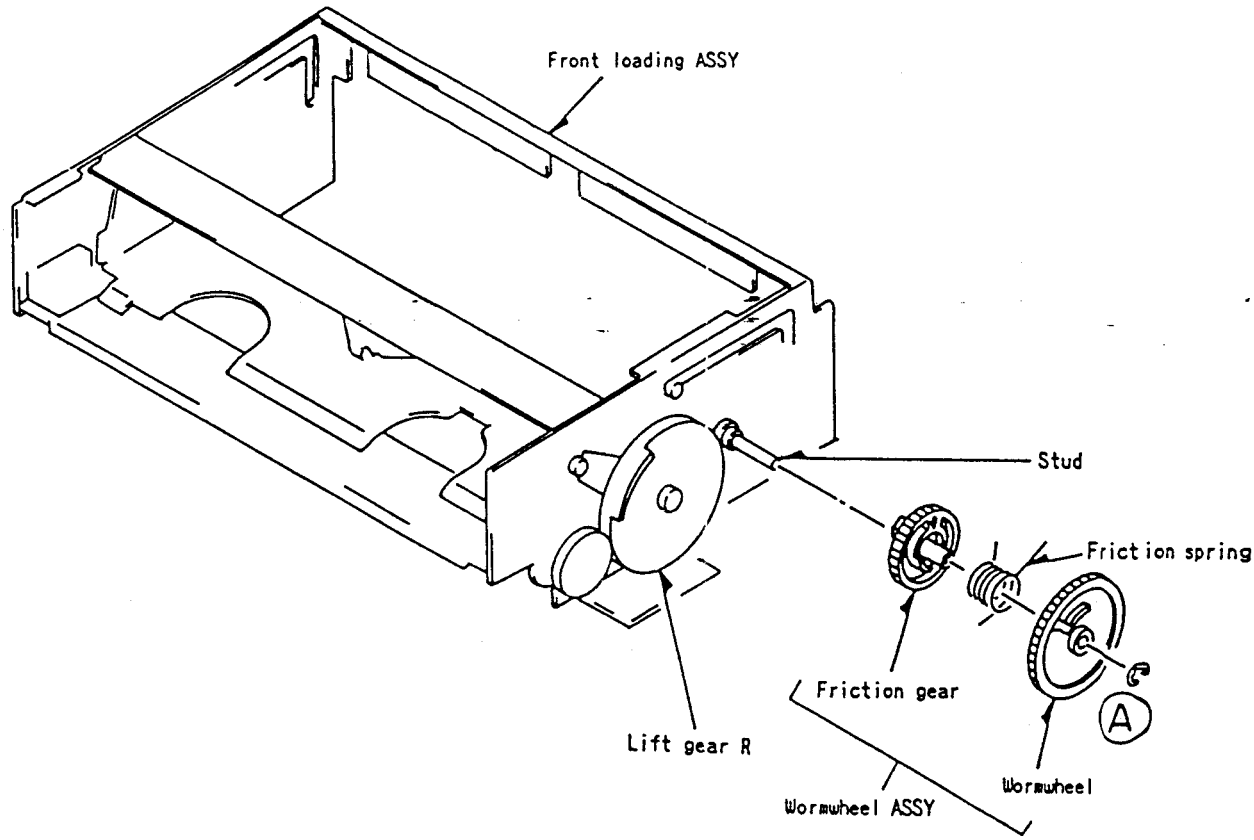
Fig-17

19. "WORMWHEEL ASSY" REMOVAL (See Figure-18)

1. Disassembly
   1) Remove "Front loading ASSY".
   2) Remove "Cassette load bracket ASSY".
   3) Remove E-Ring (A).
   4) Remove "Wormwheel ASSY". ("Wormwheel", "Friction spring", "Friction gear")
2. Assembly
   1) Turn the "Lift gear R" fully counterclockwise.
   2) Restore "Wormwheel ASSY" to the stud.

≡Remark≡

Match "Lift gear R" to the "Wormwheel hole" as illustrated.



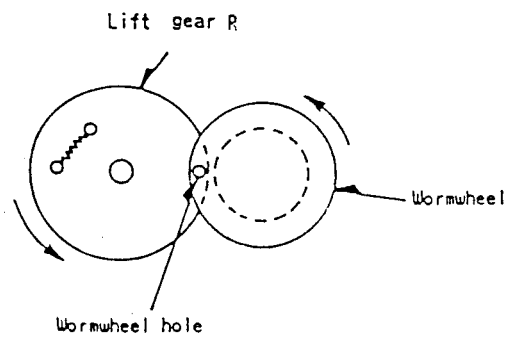


Fig-18

ELECTRICAL MAIN PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
	=== IC ===	
	87-001-778-010	IC,AN3331K
	S0-051-C02-030	IC,AN7805
	S0-9E1-C00-030	IC,AN7NC09
	87-001-853-010	IC,BA6209-V3
	87-001-777-010	IC,BA6219B
	87-001-939-010	IC,CXL5001P
	87-001-937-010	IC,CXL5003P
	S0-051-C02-010	IC,AN1431T
	80-JUB-653-010	IC,HD404302A21S
	80-JUB-652-010	IC,HD49754NT
	87-001-970-010	IC,LA7297
	87-001-938-010	IC,LA7311
	87-001-773-010	IC,LA7323
	87-001-901-010	IC,LA7333
	S0-05H-IC1-010	IC,MA2830
	80-JUB-651-010	IC,MSB5515B-1298K
	87-020-923-010	IC,PST523D
	87-001-790-010	IC,SSX1610-52(REMOTE SENSOR)
	87-027-564-010	IC,TC4011BP
	87-001-990-010	IC,TC4049 BP
	=== TRANSISTOR ===	
	87-026-452-010	TRANSISTOR,2SA933S
	87-026-463-010	TRANSISTOR,2SA933S,RS
	89-110-484-010	TRANSISTOR,2SA1048Y
	87-026-462-010	TRANSISTOR,2SC1740S(RS)
	89-322-746-010	TRANSISTOR,2SC2274 F
	87-026-219-010	TRANSISTOR,DTA144ES
	87-026-245-010	TRANSISTOR,DTC114ES
	87-026-464-010	TRANSISTOR,DTC114TS
	87-026-218-010	TRANSISTOR,DTC144ES
	=== DIODE ===	
	87-020-465-010	DIODE,1SS133
	87-020-752-010	DIODE,1SS202
	S0-05D-001-010	DIODE,S1WBA60
	S0-05D-002-010	DIODE,S3LA20-04P15
	87-027-416-010	DIODE,ZENER HZ3C2
	S1-9A0-D02-070	DIODE,ZENER RD24F-B2
	S1-9A0-D01-030	DIODE,ZENER RD6.2FB
	=== MAIN CIRCUIT BOARD SECTION ===	
C201	★87-010-263-010	CAP,ELECT 100-10
C202	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C203	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C204	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C211	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C212	★87-010-263-010	CAP,ELECT 100-10
C213	★87-010-263-010	CAP,ELECT 100-10
C221	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C222	★87-010-384-010	CAP,ELECT 100-25 SME
C301	★87-015-695-010	CAP,ELECT 1-50 7L
C302	★87-015-695-010	CAP,ELECT 1-50 7L
C303	★87-010-401-010	CAP,ELECT 1-50 SME
C304	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C305	★87-010-401-010	CAP,ELECT 1-50 SME
C306	★87-010-401-010	CAP,ELECT 1-50 SME
C307	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C308	★87-010-401-010	CAP,ELECT 1-50 SME
C309	★87-010-401-010	CAP,ELECT 1-50 SME
C310	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C321	★87-010-263-010	CAP,ELECT 100-10
C322	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C324	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C326	★87-018-109-010	CAP,CERA-SOL U 22P-50 SL
C327	★87-018-150-010	CAP,CERA-SOL U 18P-50 CH
C328	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C330	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C341	★87-010-404-010	CAP,ELECT 4.7-50 SME
C342	★87-010-404-010	CAP,ELECT 4.7-50 SME
C343	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C344	★87-010-402-010	CAP,ELECT 2.2-50 SME
C361	★87-010-405-010	CAP,ELECT 10-50 SME
C362	★87-010-402-010	CAP,ELECT 2.2-50 SME
C363	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C364	★87-010-709-010	CAP,ELECT BP 0.22-50
C366	★87-010-384-010	CAP,ELECT 100-25 SME
C367	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C368	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C369	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C370	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C371	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C372	★87-010-404-010	CAP,ELECT 4.7-50 SME
C381	★87-018-131-010	CAP,CERA-SOL U 1000P-50 B
C382	★87-010-382-010	CAP,ELECT 22-25 SME
C383	★87-010-405-010	CAP,ELECT 10-50 SME
C384	★87-018-123-010	CAP,CERA-SOL U 220P-50 B
C385	★87-010-404-010	CAP,ELECT 4.7-50 SME
C386	★87-018-119-010	CAP,CERA-SOL U 100P-50 B
C401	★87-010-374-010	CAP,ELECT 47-10
C402	★87-018-205-010	CAP,CERA-SOL U 0.022-25 F
C403	★87-010-403-010	CAP,ELECT 3.3-50 SME
C404	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C405	★87-010-405-010	CAP,ELECT 10-50 SME
C407	★87-010-402-010	CAP,ELECT 2.2-50 SME
C408	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C411	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C413	★87-018-126-010	CAP,CERA-SOL U 390P-50 B
C415	★87-018-149-010	CAP,CERA-SOL U 15P-50 CH
C416	★87-010-131-010	CAP,ELECT BP 0.47-50
C417	★87-010-615-010	CAP,ELECT BP 2.2-50
C418	★87-010-615-010	CAP,ELECT BP 2.2-50
C420	★87-018-119-010	CAP,CERA-SOL U 100P-50 B
C421	★87-018-119-010	CAP,CERA-SOL U 100P-50 B
C422	★87-018-115-010	CAP,CERA-SOL U 47P-50 SL
C424	★87-018-122-010	CAP,CERA-SOL U 180P-50 B
C426	★87-010-405-010	CAP,ELECT 10-50 SME
C432	★87-018-124-010	CAP,CERA-SOL U 270P-50 B
C433	★87-018-117-010	CAP,CERA-SOL U 68P-50 SL
C434	★87-018-107-010	CAP,CERA-SOL U 8P-50 SL
C441	★87-010-374-010	CAP,ELECT 47-10
C442	★87-010-374-010	CAP,ELECT 47-10
C445	★87-018-115-010	CAP,CERA-SOL U 47P-50 SL
C446	★87-018-119-010	CAP,CERA-SOL U 100P-50 B
C447	★87-018-115-010	CAP,CERA-SOL U 47P-50 SL
C448	★87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C449	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C450	★87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C451	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C452	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C453	★87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C454	★87-018-109-010	CAP,CERA-SOL U 22P-50 SL
C455	★87-018-117-010	CAP,CERA-SOL U 68P-50 SL
C456	★87-018-109-010	CAP,CERA-SOL U 22P-50 SL
C457	★87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C458	★87-018-209-010	CAP,CERA-SOL U 0.1-50 F

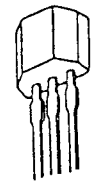
REF.NO.	PART NO.	DESCRIPTION
C459	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C460	*87-018-209-010	CAP,CERA-SOL U 0.1-50 F
C461	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C462	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C470	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C472	*87-018-123-010	CAP,CERA-SOL U 220P-50 B
C473	*87-010-405-010	CAP,ELECT 10-50 SME
C486	*87-010-385-010	CAP,ELECT 220-25
C487	*87-018-205-010	CAP,CERA-SOL U 0.022-25 F
C488	*87-010-263-010	CAP,ELECT 100-10
C489	*87-010-371-010	CAP,ELECT 470-6.3
C490	*87-010-374-010	CAP,ELECT 47-10
C491	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C492	*87-010-374-010	CAP,ELECT 47-10
C493	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C494	*87-010-405-010	CAP,ELECT 10-50 SME
C495	*87-010-405-010	CAP,ELECT 10-50 SME
C501	*87-010-374-010	CAP,ELECT 47-10
C502	*87-018-205-010	CAP,CERA-SOL U 0.022-25 F
C503	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C504	*87-018-205-010	CAP,CERA-SOL U 0.022-25 F
C505	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C506	*87-010-401-010	CAP,ELECT 1-50 SME
C507	*87-018-119-010	CAP,CERA-SOL U 100P-50 B
C508	*87-010-401-010	CAP,ELECT 1-50 SME
C509	*87-015-695-010	CAP,ELECT 1-50 7L
C510	*87-018-205-010	CAP,CERA-SOL U 0.022-25 F
C511	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C512	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C513	*87-018-119-010	CAP,CERA-SOL U 100P-50 B
C514	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C518	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C519	*87-010-401-010	CAP,ELECT 1-50 SME
C520	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C521	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C522	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C523	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C524	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C525	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C526	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C528	*87-018-114-010	CAP,CERA-SOL U 39P-50 GL
C532	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C534	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C551	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C552	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C553	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C554	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C555	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C556	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C557	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C558	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C559	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C560	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C561	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C562	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C563	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C564	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C565	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C566	*87-018-115-010	CAP,CERA-SOL U 47P-50 SL
C601	*87-010-260-010	CAP,ELECT 47-25 SME
C602	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C603	*87-010-263-010	CAP,ELECT 100-10
C604	*87-010-404-010	CAP,ELECT 4.7-50 SME
C605	*87-010-403-010	CAP,ELECT 3.3-50 SME
C606	*87-010-403-010	CAP,ELECT 3.3-50 SME
C607	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C608	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C609	*87-018-121-010	CAP,CERA-SOL U 150P-50 B
C610	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C784	*87-018-203-010	CAP,CERA-SOL U 8200P-16 Y
CL201	*87-030-214-010	RESONATOR,CERAMIC KBR6.0MKS
DL501	*80-JUB-675-010	DELAY,ADL-FN1344W
DL502	*80-JUB-676-010	DELAY,ADL-FE2544W
DL503	*80-JUB-674-010	DELAY,ADL-FN1334W
FL401	*89-JU8-618-010	FILTER,MXV-7XF 3M
FL501	*87-008-443-010	FILTER,SFS4.21ME
FL502	*87-008-416-010	FILTER,SFS 5.06ME
FL503	*80-JU1-663-010	FILTER,LPF 1.1MHZ
FL504	*80-JUB-672-010	FILTER,BPF 3.58MHZ
FL505	*80-JUB-673-010	FILTER,BPF 4.43MHZ
J401-1	*87-009-174-010	JACK,PIN 4P(AUDIO IN)
J401-2	+++	JACK,PIN 4P(VIDEO IN)
J401-3	+++	JACK,PIN 4P(AUDIO OUT)
J401-4	+++	JACK,PIN 4P(VIDEO OUT)
L201	*87-005-440-010	COIL,47UH FLR50
L202	*87-003-154-010	COIL,220UH
L301	*87-005-440-010	COIL,47UH FLR50
L302	*87-006-189-010	COIL,220UH EL0909
L303	*87-006-189-010	COIL,220UH EL0909
L401	*87-005-436-010	COIL,22UH FLR50,K
L402	*87-003-102-010	COIL,10UH
L431	*87-003-288-010	COIL,180UH LAL02
L432	*87-003-286-010	COIL,56UH LAL02
L441	*87-005-436-010	COIL,22UH FLR50,K
L442	*87-005-436-010	COIL,22UH FLR50,K
L443	*87-003-150-010	COIL,68UH LAL02
L444	*87-003-150-010	COIL,68UH LAL02
L445	*87-003-150-010	COIL,68UH LAL02
L446	*87-003-150-010	COIL,68UH LAL02
L486	*87-005-456-010	COIL,1000UH FLR50,K
L488	*87-003-152-010	COIL,100UH
L501	*87-005-436-010	COIL,22UH FLR50,K
L503	*87-003-283-010	COIL,18UH LAL02
L551	*87-003-146-010	COIL,15UH LAL02
L552	*87-003-146-010	COIL,15UH LAL02
L553	*87-003-146-010	COIL,15UH LAL02
L554	*87-003-285-010	COIL,39UH LAL02
L601	*87-005-444-010	COIL,100UH
L602	*87-003-102-010	COIL,10UH
⚠R281	87-029-361-010	RES,FUSE 3.3-1/2W
⚠R376	87-029-361-010	RES,FUSE 3.3-1/2W
R410	*87-025-423-010	RES,MF 4.7K-1/6W F
RA201	*84-487-615-010	RES,ARRAY,10KX12 LE
RA202	*84-487-615-010	RES,ARRAY,10KX12 LE
RA203	*80-JUB-657-010	RES,ARRAY,10KX10 LE
RA204	*80-JUB-656-010	RES,ARRAY,10KX5 LE
RF386	89-JU9-607-010	RF MODULATER MDLK 6E273A
SFR301	*87-024-177-010	SFR,220K
SFR302	*87-024-176-010	SFR,100K
SFR401	*87-024-172-010	SFR,10K
SFR402	*87-024-172-010	SFR,10K
SFR403	*87-024-172-010	SFR,10K
SFR404	*87-024-168-010	SFR,1K
SFR405	*87-024-169-010	SFR,2.2K
SFR406	*87-024-169-010	SFR,2.2K
SFR431	*87-024-170-010	SFR,3.3K
SFR531	*87-024-168-010	SFR,1K
SW401	87-036-185-010	SLIDE SW(PICTURE)

REF.NO.	PART NO.	DESCRIPTION
X301	*80-JUB-655-010	RESONATOR,CRYSTAL 13.3M
X302	*80-JUB-654-010	RESONATOR,CRYSTAL 10.7M
X501	*80-JUB-678-010	RESONATOR,CRYSTAL 3.58M
X502	*89-JU7-641-010	RESONATOR,CRYSTAL 4.43M
=== FRONT CIRCUIT BOARD SECTION ===		
C901	*87-015-681-010	CAP,ELECT 10-16 7L
C902	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
D912	87-001-123-010	LED,SLZ-981C-02(POWER)
D913	87-001-124-010	LED,SLZ-381C-02(PAL)
D914	87-001-124-010	LED,SLZ-381C-02(MESEC)
D915	87-001-124-010	LED,SLZ-381C-02(NTSC 3.58)
D916	87-001-124-010	LED,SLZ-381C-02(NTSC 4.43)
D917	87-001-824-010	LED,LT3S473(AUTO TRACKING)
D918	87-001-123-010	LED,SLZ-981C-02(RECORD)
S901	87-036-215-010	TACT SW(POWER)
S902	87-036-215-010	TACT SW(EJECT)
S903	87-036-215-010	TACT SW(STOP)
S904	87-036-215-010	TACT SW(FF)
S905	87-036-215-010	TACT SW(REW)
S906	87-036-215-010	TACT SW(PLAY)
S907	87-036-215-010	TACT SW(PAUSE/STILL)
S908	87-036-215-010	TACT SW(RECORD)
S909	87-036-215-010	TACT SW(SYSTEM)
S910	87-036-215-010	TACT SW(TRACKING +)
S911	87-036-215-010	TACT SW(TRACKING -)
S912	87-036-178-010	SLIDE SW(AUTO TRACKING)
=== HEAD AMP/AUDIO CIRCUIT BOARD SECTION ===		
C651	*87-018-131-010	CAP,CERA-SOL U 1000P-50 B
C652	*87-015-695-010	CAP,ELECT 1-50 7L
C653	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C654	*87-018-208-010	CAP,CERA-SOL U 0.047-50 F
C655	*87-015-695-010	CAP,ELECT 1-50 7L
C656	*87-015-681-010	CAP,ELECT 10-16 7L
C657	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C658	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C659	*87-015-677-010	CAP,ELECT 100-6.3 7L
C660	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C661	*87-018-115-010	CAP,CERA-SOL U 47P-50 SL
C663	*87-018-117-010	CAP,CERA-SOL U 68P-50 SL
C664	*87-018-113-010	CAP,CERA-SOL U 33P-50 SL
C665	*87-018-109-010	CAP,CERA-SOL U 22P-50 SL
C666	*87-018-119-010	CAP,CERA-SOL U 100P-50 B
C667	*87-018-112-010	CAP,CERA-SOL U 30P-50 SL
C668	*87-018-125-010	CAP,CERA-SOL U 330P-50 B
C669	*87-018-107-010	CAP,CERA-SOL U 18P-50 SL
C670	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C671	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C672	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C673	*87-010-260-010	CAP,ELECT 47-25 SME
C674	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C675	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C676	*87-018-104-010	CAP,CERA-SOL U 10P-50 SL
C679	*87-018-118-010	CAP,CERA-SOL U 82P-50 B
C701	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C702	*87-010-384-010	CAP,ELECT 100-25 SME
C703	*87-010-405-010	CAP,ELECT 10-50 SME
C704	*87-010-265-010	CAP,ELECT 33-16 SME
C711	*87-010-404-010	CAP;ELECT 4.7-50 SME
C714	*87-010-404-010	CAP,ELECT 4.7-50 SME
C721	*87-018-127-010	CAP,CERA-SOL U 470P-50 B
C722	*87-010-382-010	CAP,ELECT 22-25 SME
C731	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y

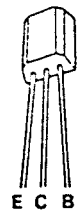
REF.NO.	PART NO.	DESCRIPTION
C732	*87-018-127-010	CAP,CERA-SOL U 470P-50 B
C733	*87-018-196-010	CAP,CERA-SOL U 1500P-16 X
C734	*87-010-401-010	CAP,ELECT 1-50 SME
C735	*87-010-265-010	CAP,ELECT 33-16 SME
C737	*87-010-401-010	CAP,ELECT 1-50 SME
C741	*87-018-123-010	CAP,CERA-SOL U 220P-50 B
C743	*87-018-131-010	CAP,CERA-SOL U 1000P-50 B
C744	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C745	*87-015-684-010	CAP,ELECT 47-16 7L
L651	*87-005-444-010	COIL,100UH
L652	*87-003-149-010	COIL,47UH
L653	*87-003-148-010	COIL,33UH
L654	*87-003-145-010	COIL,8.2UH LALO2
L655	*87-003-288-010	COIL,180UH LALO2
L656	*87-003-147-010	COIL,22UH
L657	*87-005-444-010	COIL,100UH
L658	*87-003-150-010	COIL,68UH LALO2
L659	*87-003-151-010	COIL,82UH LALO2
L701	*87-005-239-010	COIL,100UH
L710	*87-005-398-010	COIL,8.2MMH LHL06
T741	*80-JUB-671-010	COIL,OSC BIAS-70K
=== AUTO TRACKING CIRCUIT BOARD SECTION ===		
C951	*87-018-121-010	CAP,CERA-SOL U 150P-50 B
C952	*87-018-121-010	CAP,CERA-SOL U 150P-50 B
C955	*87-018-131-010	CAP,CERA-SOL U 1000P-50 B
C956	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C957	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C958	*87-018-202-010	CAP,CERA-SOL U 6800P-16 X
C959	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C960	*87-015-681-010	CAP,ELECT 10-16 7L
C962	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C963	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
C964	*87-010-263-010	CAP,ELECT 100-10
C965	*87-010-263-010	CAP,ELECT 100-10
C966	*87-018-134-010	CAP,CERA-SOL U 0.01-16 Y
CL951	*87-030-198-010	RESONATOR,CERAMIC KBR-4.0MKS
L951	*87-003-149-010	COIL,47UH
L952	*87-005-514-010	COIL,8.2UH J LALO2
L953	*87-003-149-010	COIL,47UH
=== BASE CIRCUIT BOARD SECTION ===		
PCB-E	*S8-059-133-020	BASE PCB ASSY
CP1	S6-808-080-030	PHOTO(REEL) SENSOR ON1385
=== RELAY CIRCUIT BOARD-1 SECTION ===		
PCB-F	*S8-059-013-470	RELAY PCB-1 ASSY
=== SWITCH CIRCUIT BOARD SECTION ===		
PCB-G	*S8-059-163-330	SWITCH PCB ASSY(W/SW1,2,3)
=== RELAY CIRCUIT BOARD-2 SECTION ===		
=== RELAY CIRCUIT BOARD-3 SECTION ===		
=== RELAY CIRCUIT BOARD-4 SECTION ===		
PCB-J	S8-059-013-050	RELAY PCB-4 ASSY
=== RELAY CIRCUIT BOARD-5 SECTION ===		

TRANSISTOR ILLUSTRATION

2SA933
2SC1740
2SC2274



DTA144
DTC114
DTC144

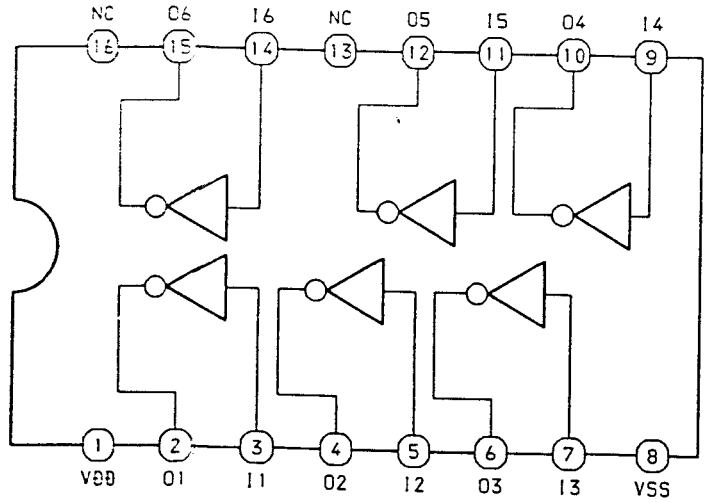


2SA1048

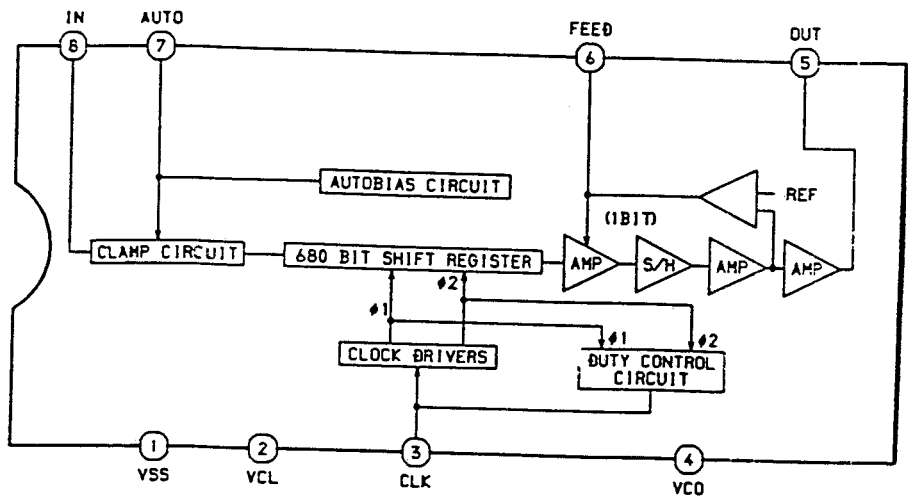
REF.NO.	PART NO.	DESCRIPTION
		=== ACE HEAD CIRCUIT BOARD SECTION ===
ACEH	S6-204-150-060	ACE HEAD HV225211 (W/PCB-L)
		=== END SENSOR CIRCUIT BOARD SECTION ===
PCB-M	★S8-059-163-010	SENSOR PCB LM ASSY
		=== START SENSOR CIRCUIT BOARD SECTION ===
PCB-N	★S8-059-163-160	SENSOR PCB RM ASSY
		=== LED CIRCUIT BOARD SECTION ===
LED1	★S8-059-133-030	LED ASSY(W/PCB-O)
		=== ERASE HEAD CIRCUIT BOARD SECTION ===
FEH	S6-204-150-030	FULL ERASE HEAD(W/PCB-P)
		=== POWER CIRCUIT BOARD-1 SECTION ===
⚠C1	★S0-05C-001-010	CAP,FILM 0.22 250V
⚠F1	S0-05F-001-010	FUSE,T1.6A 250V
⚠J1	S0-051-NLE-T00	AC JACK(AC)
⚠L1	S0-05L-001-010	COIL,CHOKE 15MMH 0.5A
		=== POWER CIRCUIT BOARD-2 SECTION ===
C2-1	★S9-EVC-000-210	CAP,CERA 3300P-250
C2-2	★S9-EVC-000-210	CAP,CERA 3300P-250
C2-3	★S9-EVC-000-210	CAP,CERA 3300P-250
C3	★S0-05C-001-040	CAP,ELECT 82-400
C4	★S0-05C-001-050	CAP,FILM 0.047-600
C5	★S0-05C-001-070	CAP,ELECT 1-400
C7	★S0-9EC-000-070	CAP,ELECT 680-25
C8	★87-010-387-010	CAP,ELECT 470-25
C9	★S0-9EC-000-070	CAP,ELECT 680-25
C10	★87-010-387-010	CAP,ELECT 470-25
C11	★S0-05C-002-010	CAP,0.047-50
C12	★87-010-029-010	CAP,0.047-50
C13	★87-010-263-010	CAP,ELECT 100-10
C14	★87-010-622-010	CAP,ELECT 470-16
C15	★87-015-869-010	CAP,ELECT 100-16
L2	★S0-05L-002-010	COIL,CHOKE 39UH 1A
L3	★S0-05L-002-010	COIL,CHOKE 39UH 1A
PC1	S0-05P-C01-010	PHOTO COUPLER ON3171
R1	S0-05R-001-020	RES,NF 47K 3W
R4	S9-EVR-000-040	RES,NF 56 1W
R5	S9-EVR-000-040	RES,NF 56 1W
⚠R6	87-092-102-010	RES,FUSE 47 1/4W
R8	S0-05R-002-020	RES,240 1/2W
R9	★S0-05R-002-020	RES,100
R10	87-025-306-010	RES,MF 5.6K 1/4W
R11	S0-9ER-000-110	RES,MF 240
R12	87-025-307-010	RES,MF 1.,5K 1/4W
R21	83-131-616-010	RES,NF 2.2 3W
R22	87-025-437-010	RES,NF 82 1W
R23	87-025-437-010	RES,NF 82 1W
T1	S0-9ET-000-010	TRANSFORMER,TS29K20V
		=== MISCELLANEOUS ===
	S8-059-010-190	UPPER DRUM(W/VIDEO HEAD)
	S8-059-013-040	LOWER DRUM ASSY
DS1	★S6-808-080-040	DEW SENSOR EYH-S10R
M1	S6-004-090-010	CYLIDER MOTOR TM82
M2	S8-059-073-020	CAPSTAN MOTOR ASSY
M3	S8-059-113-010	LOADING MOTOR ASSY
SW4	S6-401-011-510	LEAF SW(REC PREVENTION)

IC BLOCK DIAGRAM

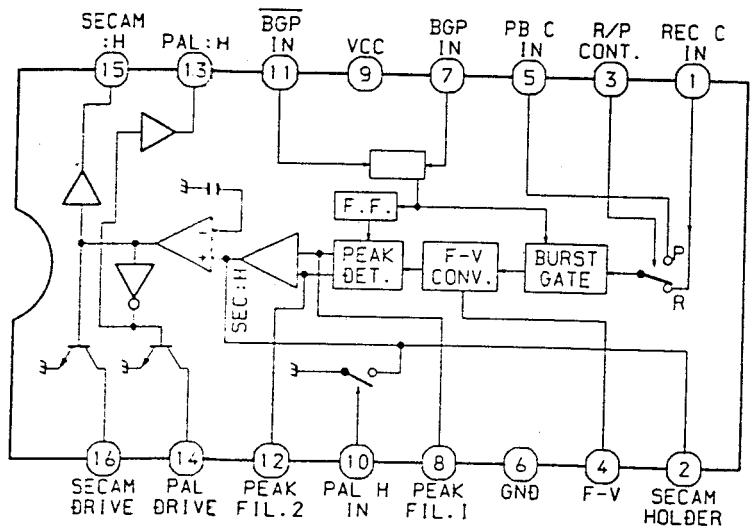
IC,TC4049BP



IC,CXL5001P,IC,CXL5003P

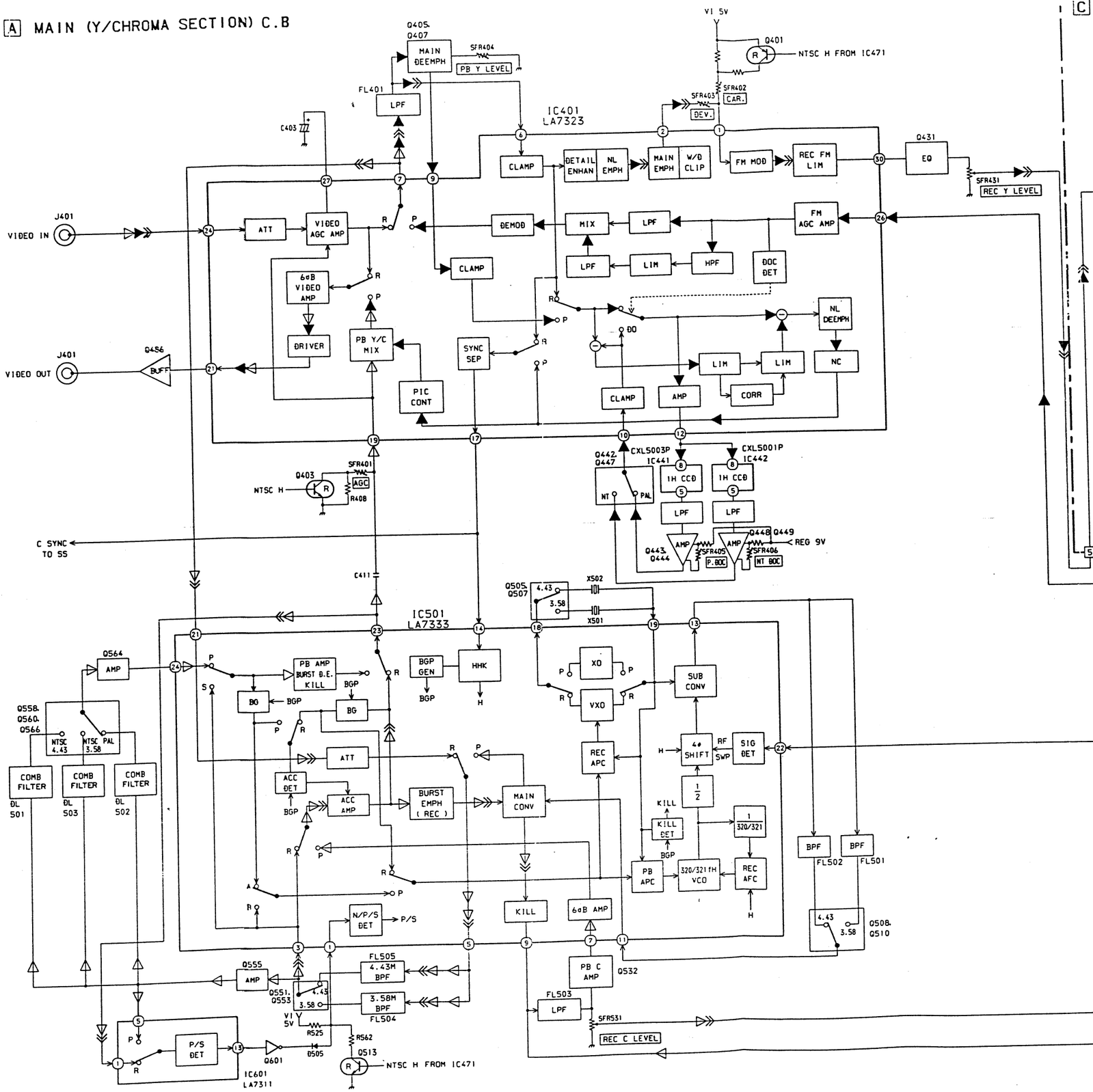


IC,LA7311

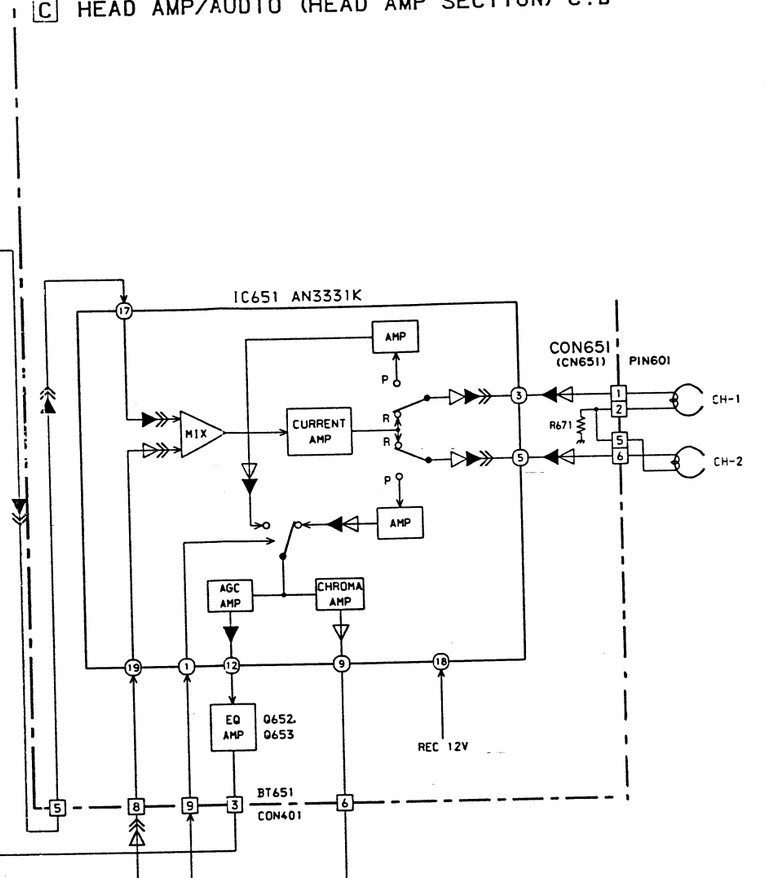


BLOCK DIAGRAM — 1 (VIDEO SECTION)

A MAIN (Y/CHROMA SECTION) C.B

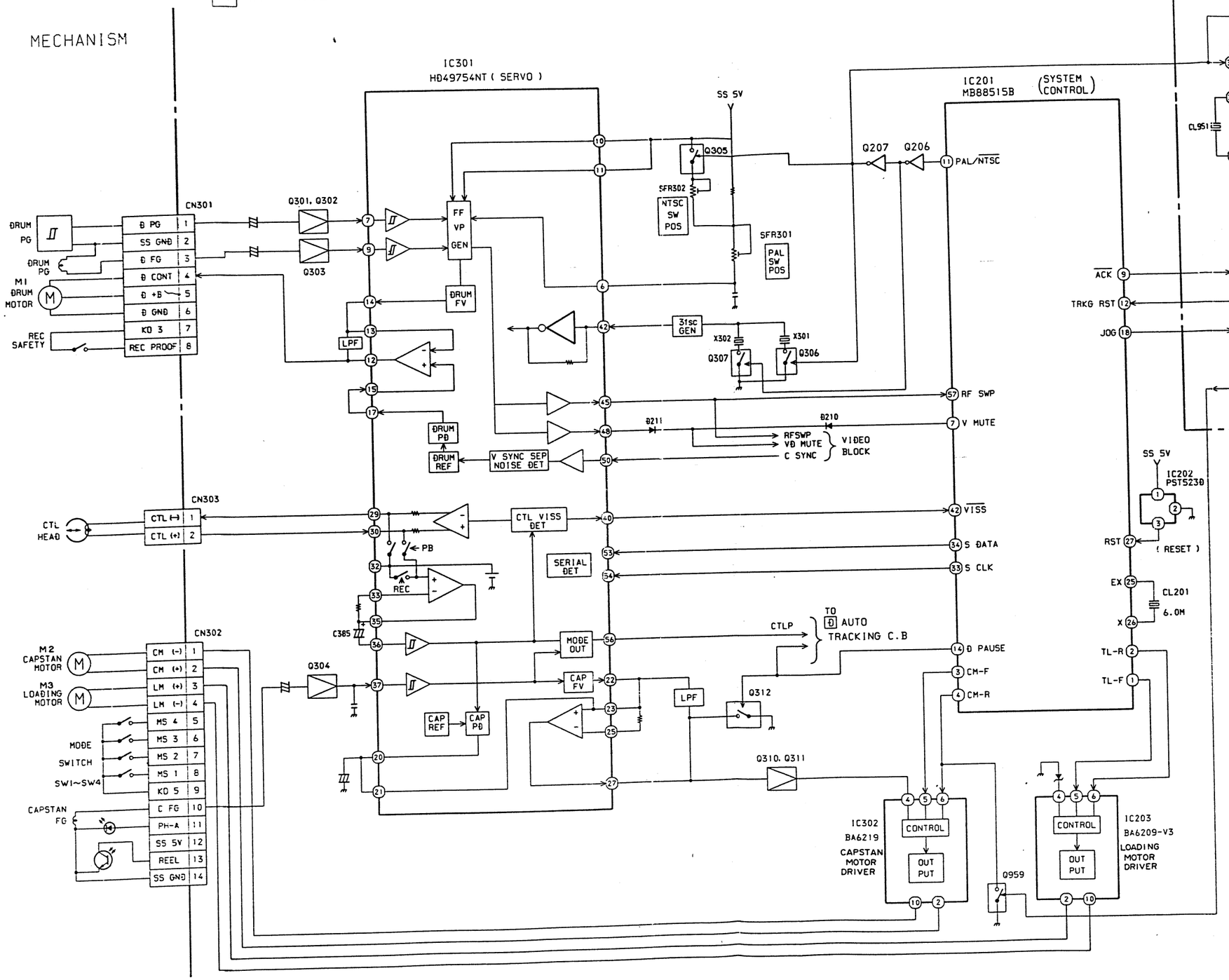


C HEAD AMP/AUDIO (HEAD AMP SECTION) C.B

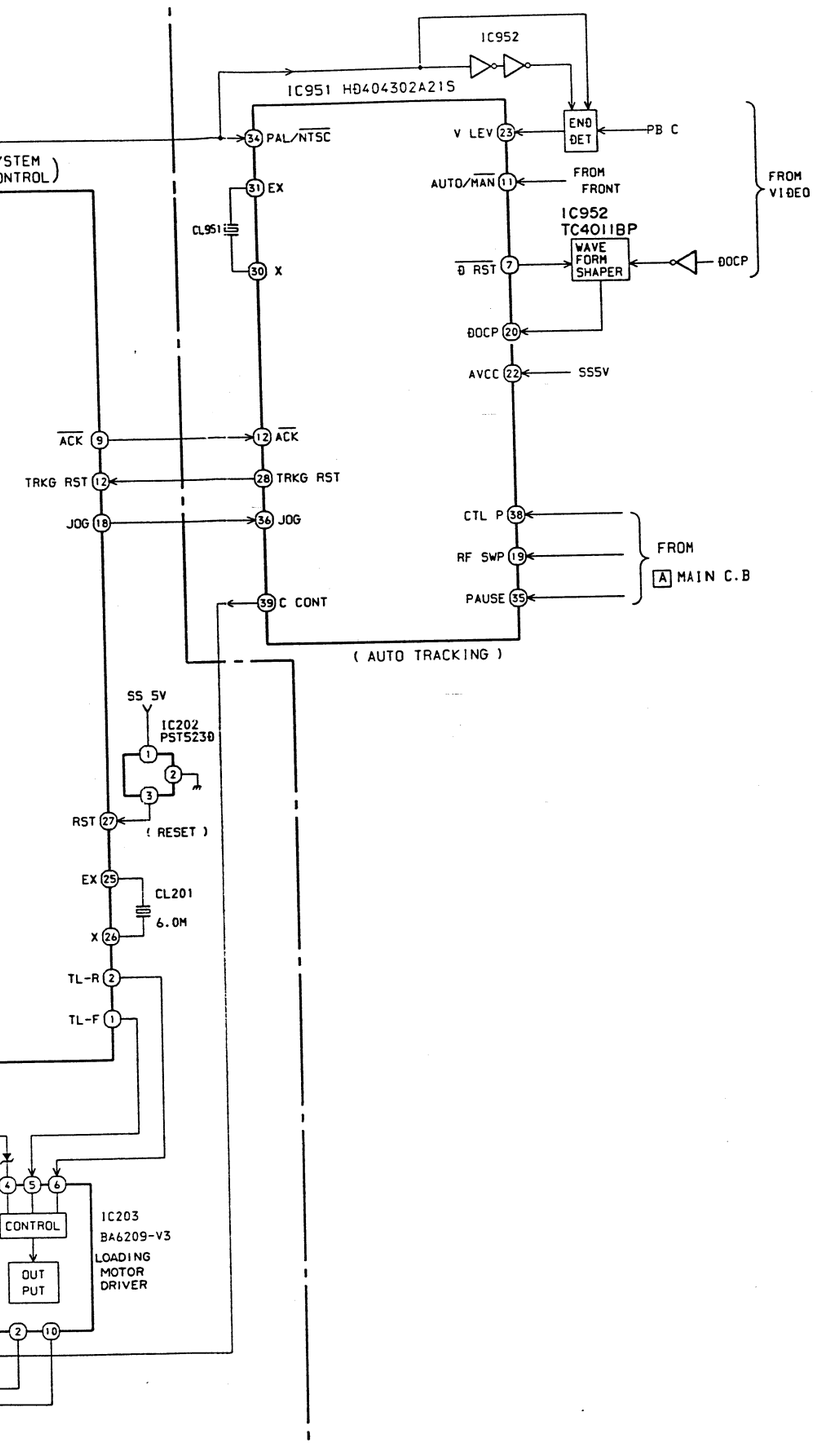


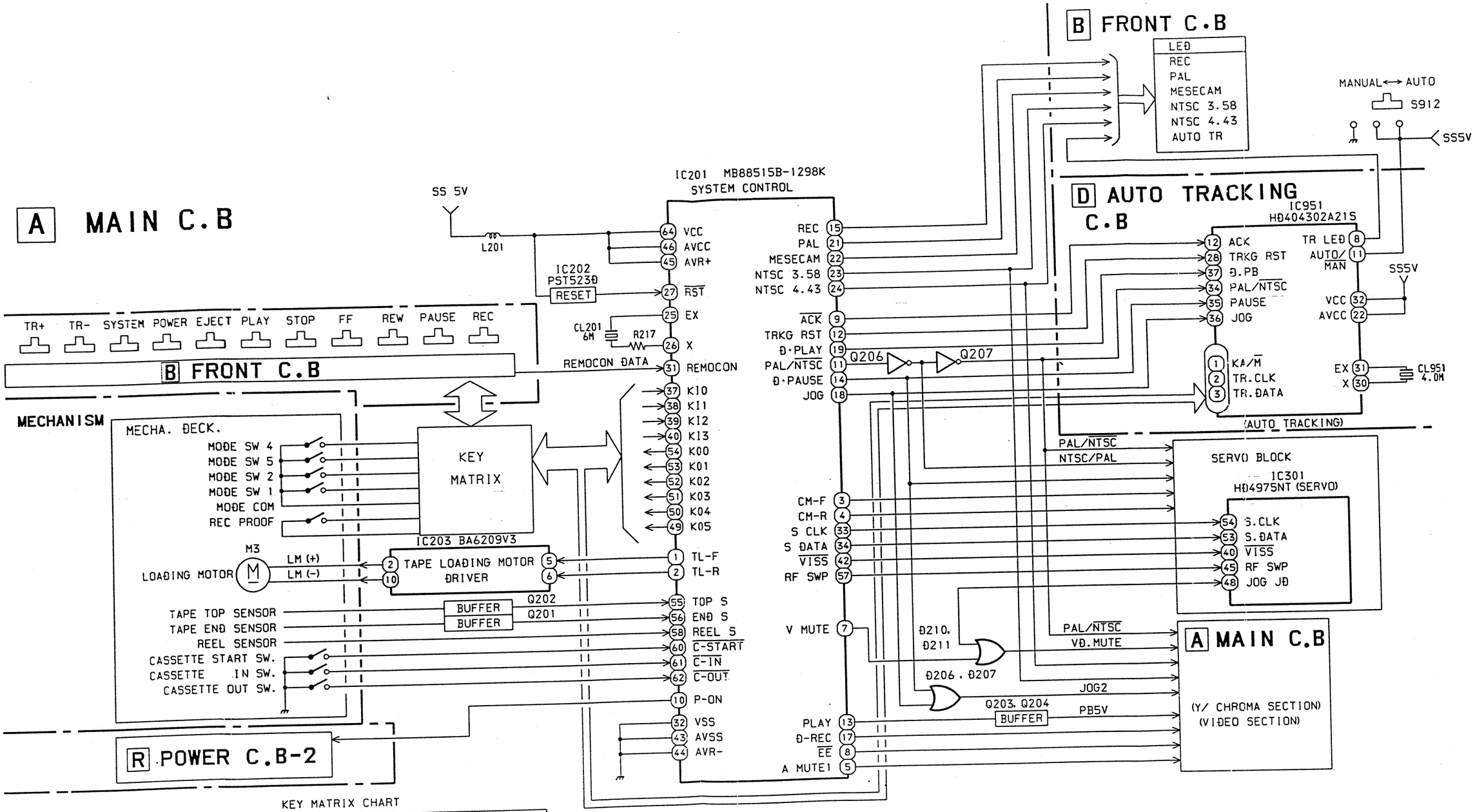
BLOCK DIAGRAM — 2 (SERVO/SYSTEM CONYROL SECTION)

A MAIN C.B (SERVO/SYSTEM CONTROL SECTION)



D AUTO TRACKING C.B



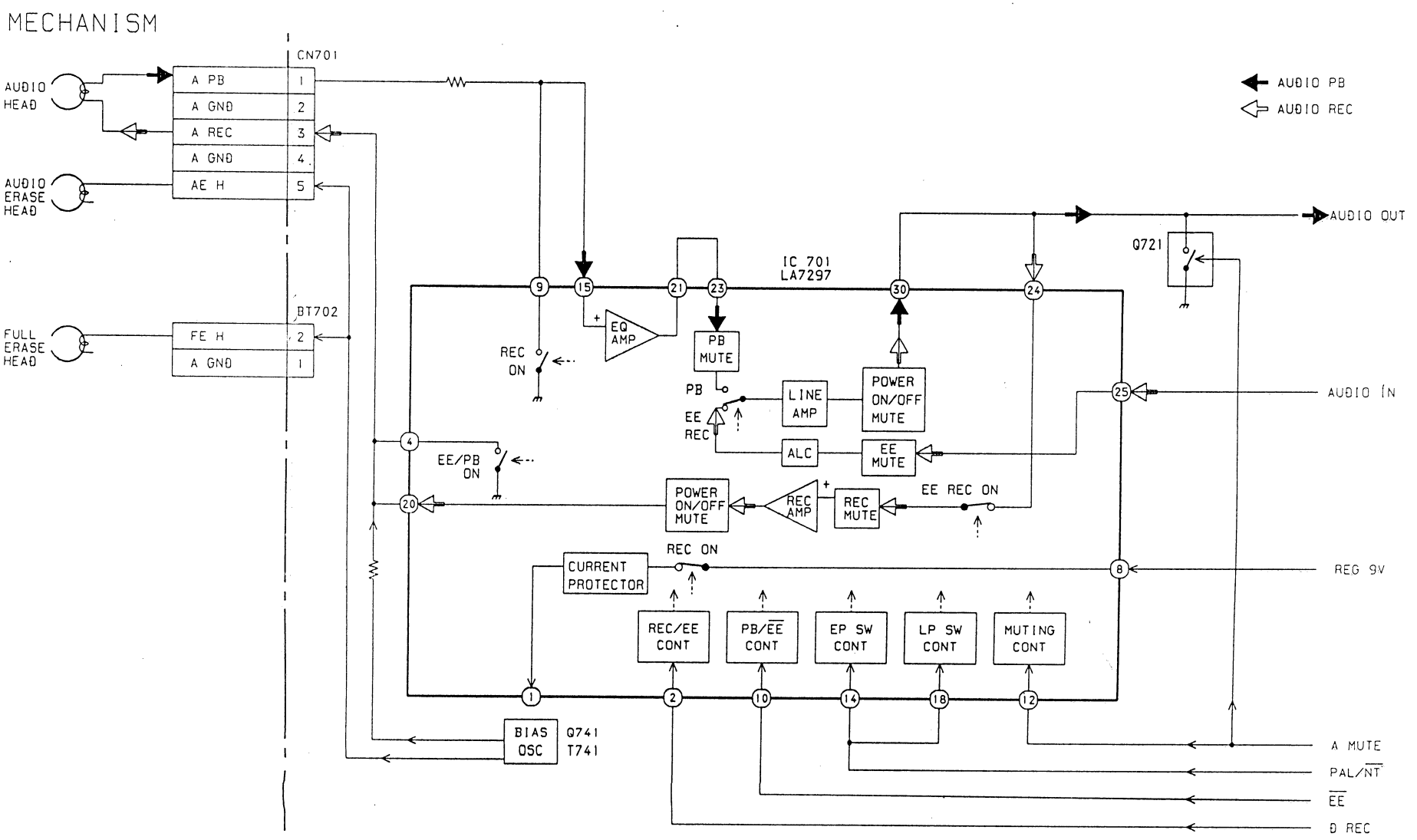


KEY MATRIX CHART

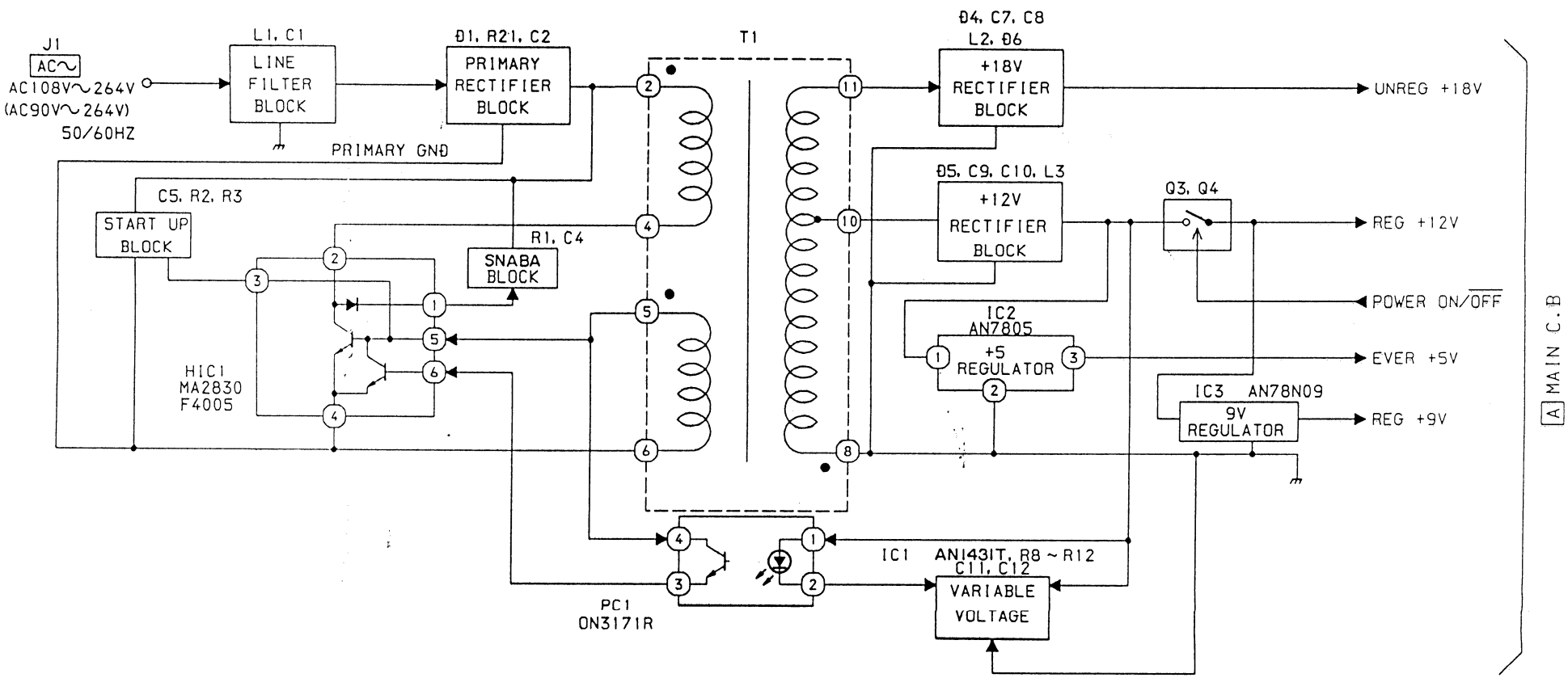
	KI0	KI1	KI2	KI3
KO0	K·TEST	K·STOP	K·EJECT	K·POWER
KO1	K·PAUSE/STILL	K·PLAY	K·REW	K·FF
KO2	K·TRACKING-	K·TRACKING+	K·SYSTEM	K·REC
KO3	REC MODE	VCR	REC PROOF	K·REPEAT
KO4	TRACKING-	TRACKING+	TR·AUTO/MAN	PAL/MESECAM
KO5	MODE SW 1	MODE SW 2	MODE SW 3	MODE SW 4

AUDIO BLOCK DIAGRAM (HV-M10)

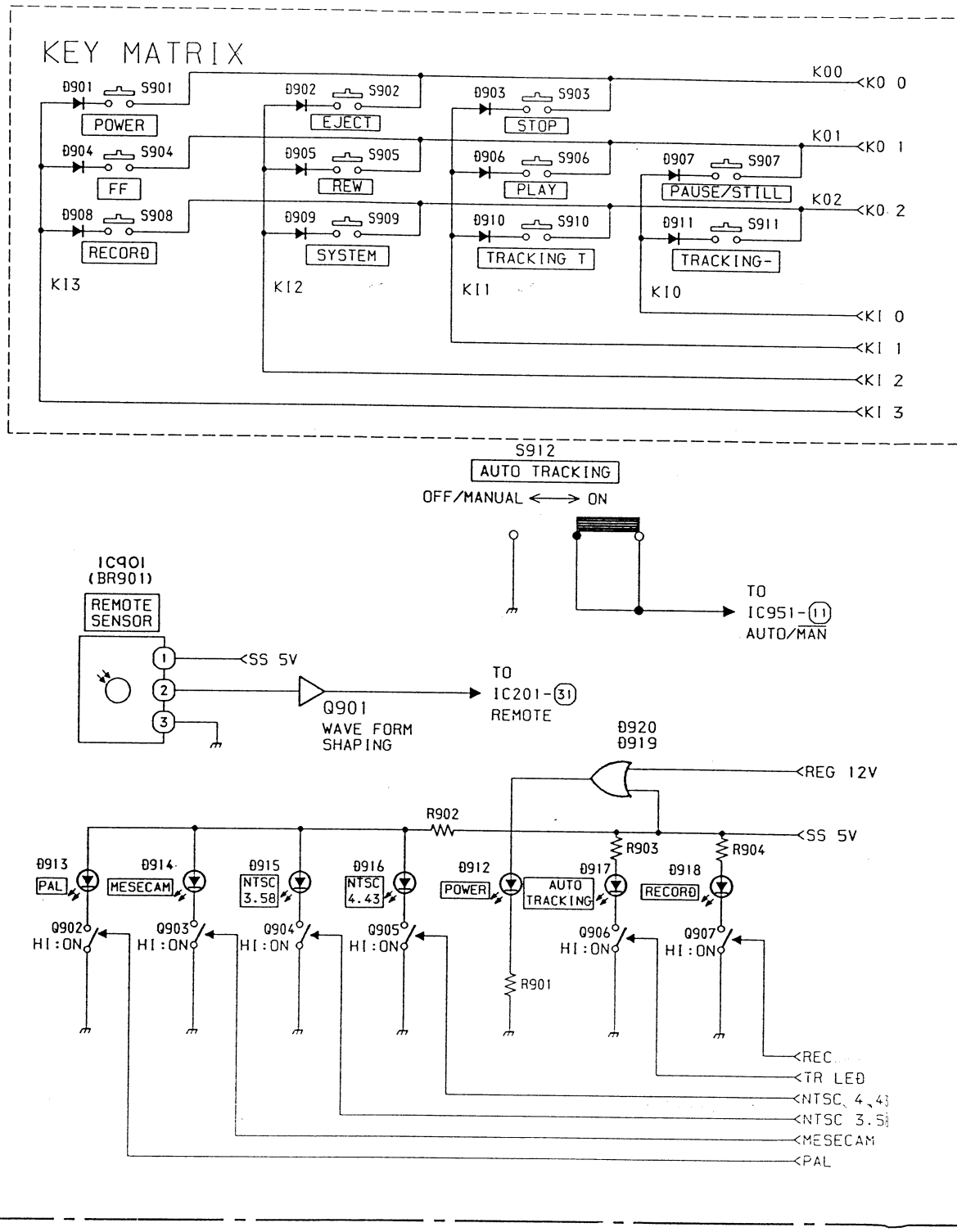
C HEAD AMP/AUDIO (AUDIO SECTION) C-B



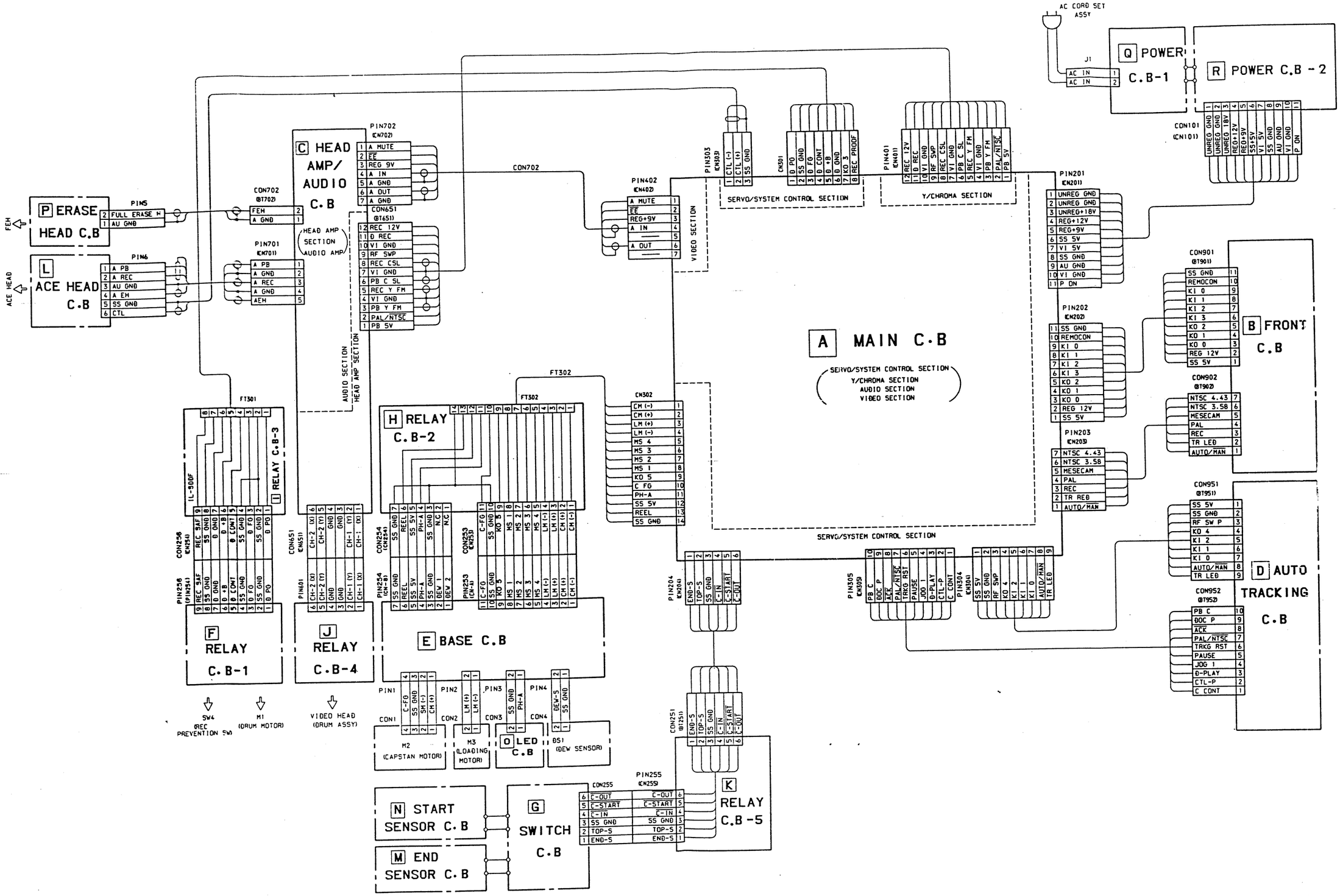
POWER (POWER SECTION) C.B



B FRONT C.B

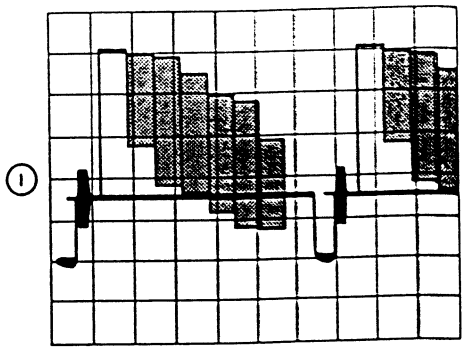

KEY MATRIX
D901 S901
POWER
D902 S902
EJECT
D903 S903
STOP
D904 S904
FF
D905 S905
REW
D906 S906
PLAY
D907 S907
PAUSE/STILL
D908 S908
RECORD
D909 S909
SYSTEM
D910 S910
TRACKING T
D911 S911
TRACKING-
KI3
KI2
KI1
KI0
K00
K01
K02
<K0 0
<K0 1
<K0 2
<KI 0
<KI 1
<KI 2
<KI 3
S912
AUTO TRACKING
OFF/MANUAL ⟷ ON
TO
IC951-(11)
AUTO/MAN
IC901
(BR901)
REMOTE
SENSOR
<5S 5V
TO
IC201-(31)
REMOTE
Q901
WAVE FORM
SHAPING
D920
D919
<REG 12V
R902
<SS 5V
R903
R904
D913
PAL
D914
MESECAM
D915
NTSC
3.58
D916
NTSC
4.43
D912
POWER
D917
AUTO
TRACKING
D918
RECORD
Q902
HI:ON
Q903
HI:ON
Q904
HI:ON
Q905
HI:ON
Q906
HI:ON
Q907
HI:ON
R901
<REC
<TR LED
<NTSC 4.43
<NTSC 3.58
<MESECAM
<PAL

WIRE HARNESS DIAGRAM

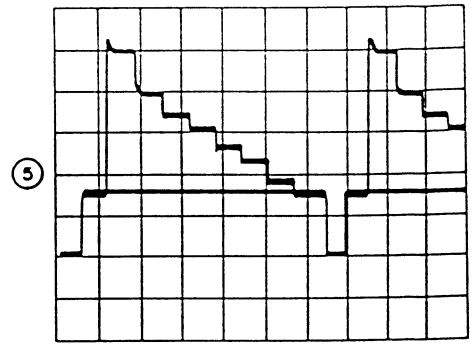


WAVE FORM — 1 (VIDEO SECTION)

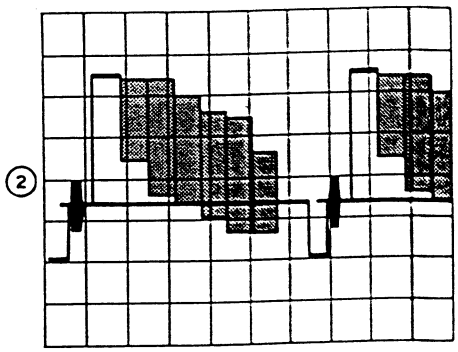
LINE IN (EE, PAL)
200mV/div.
10μs/div.



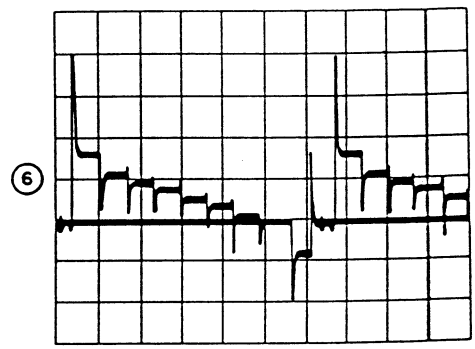
IC401 Pin ⑥ (EE, PAL)
100mV/div.
10μs/div.



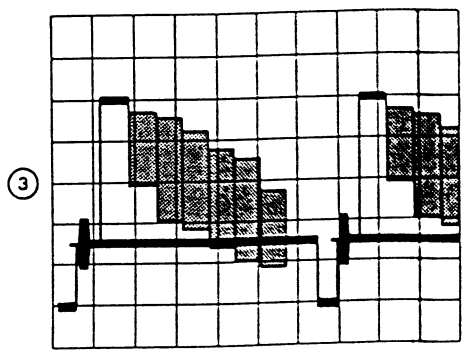
IC401 Pin ㉑ (EE, PAL)
500mV/div.
10μs/div.



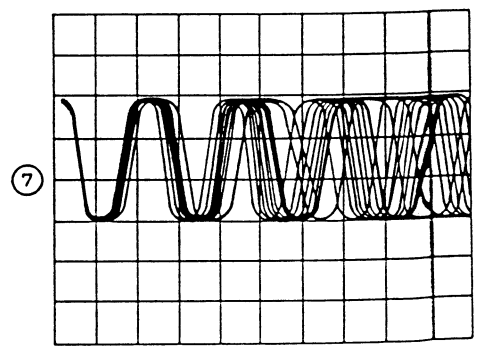
IC401 Pin ② (EE, PAL)
200mV/div.
10μs/div.



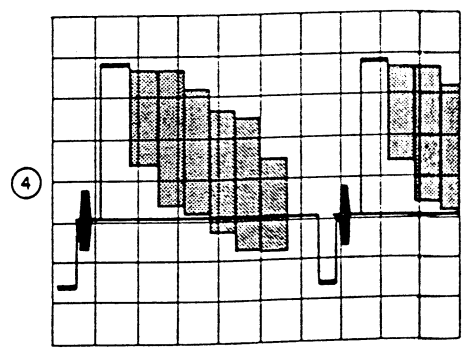
LINE OUT (EE, PAL)
200mV/div.
10μs/div.



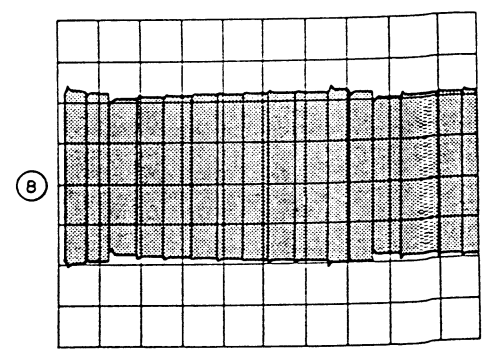
IC401 Pin ㉚ (EE, PAL)
500mV/div.
100ns/div.



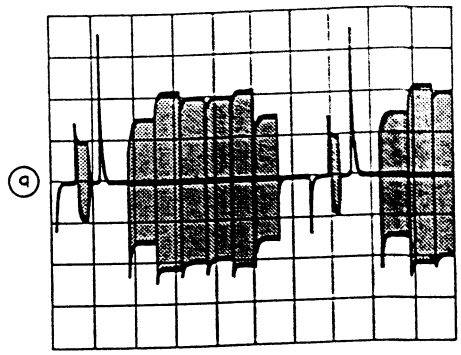
IC401 Pin ⑦ (EE, PAL)
200mV/div.
10μs/div.



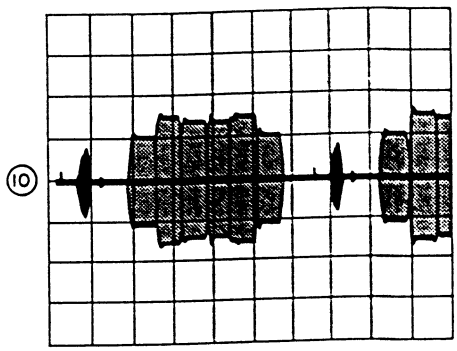
CN401 Pin ⑤ (EE, PAL)
100mV/div.
10μs/div.



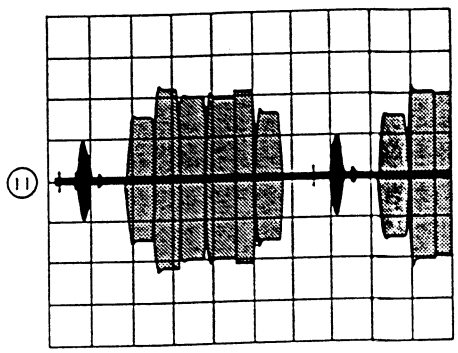
IC501 Pin ⑤ (EE, PAL)
100mV/div.
10μs/div.



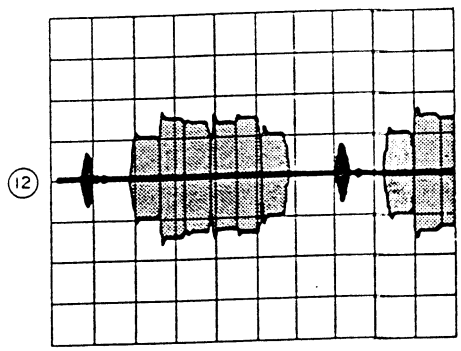
IC501 Pin ③ (EE, PAL)
50mV/div.
10μs/div.



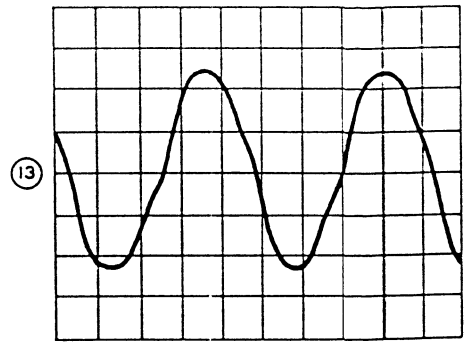
IC501 Pin ⑨ (EE, PAL)
200mV/div.
10μs/div.



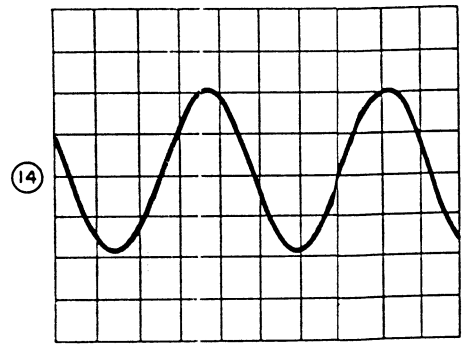
CN401 Pin ⑧ (EE, PAL)
50mV/div.
10μs/div.



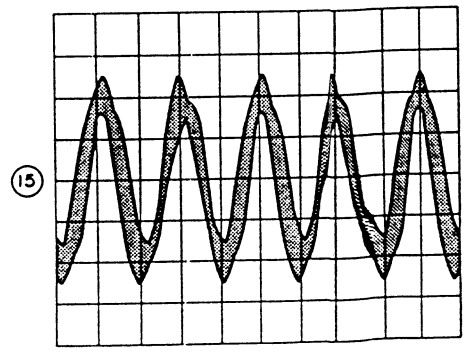
IC501 Pin ⑱ (EE, PAL)
200mV/div.
50ns/div.



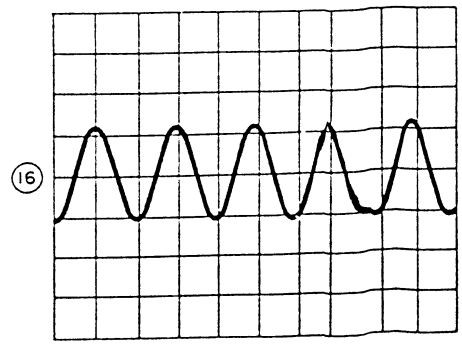
IC501 Pin ⑲ (EE, PAL)
200mV/div.
50ns/div.



IC501 Pin ⑬ (EE, PAL)
50mV/div.
100ns/div.

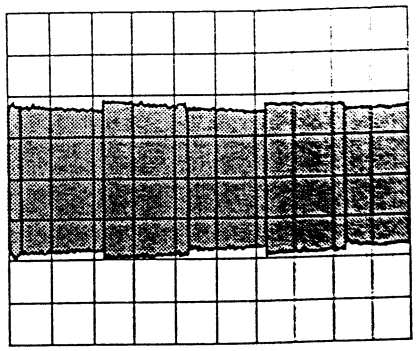


IC501 Pin ⑪ (EE, PAL)
50mV/div.
100ns/div.



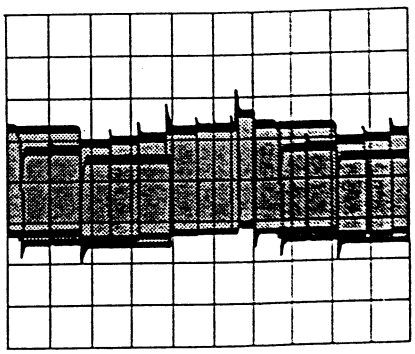
CN401 Pin ③ (PB, PAL)
100mV/div.
50ms/div.

⑰



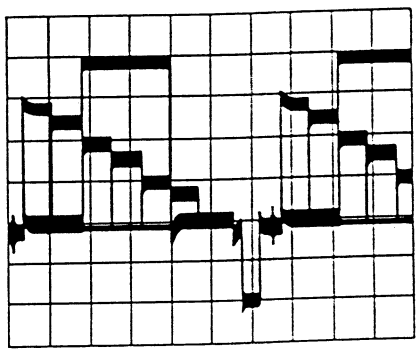
IC401 Pin ⑦ (PB, PAL)
500mV/div.
10μs/div.

⑱



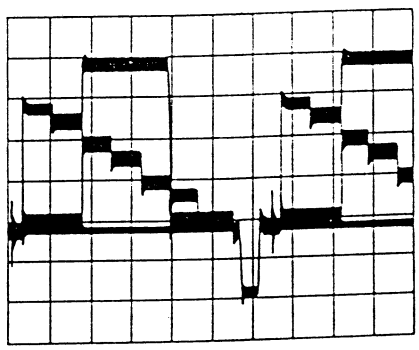
IC401 Pin ⑨ (PB, NTSC)
100mV/div.
10μs/div.

⑲



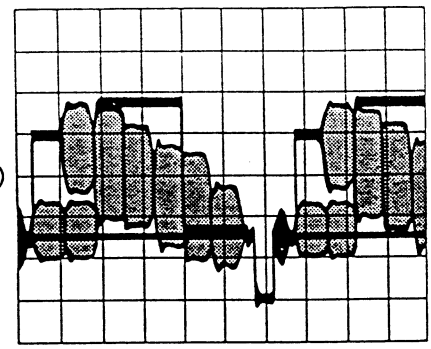
IC401 Pin ⑩ (PB, PAL)
100mV/div.
10μs/div.

⑳



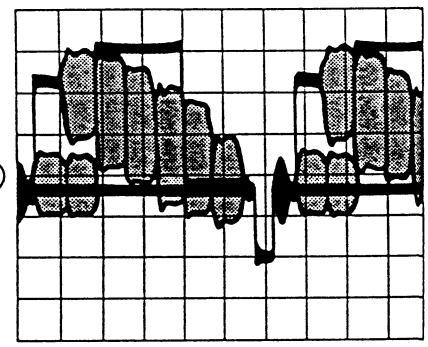
IC401 Pin ㉑ (PB, PAL)
500mV/div.
10μs/div.

㉑



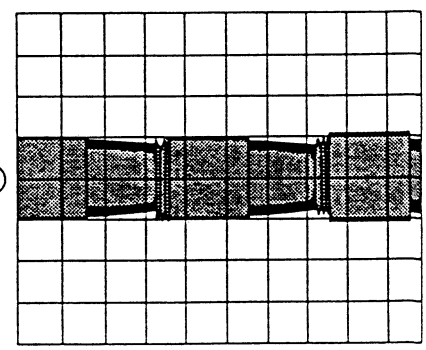
LINE OUT (PB, PAL)
200mV/div.
10μs/div.

㉒



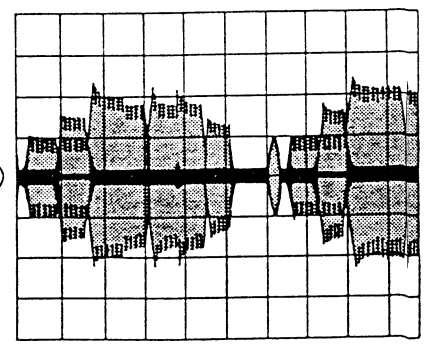
CN401 Pin ⑥ (PB, PAL)
100mV/div.
5ms/div.

㉓



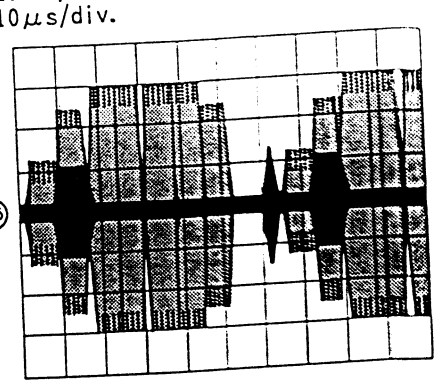
IC501 Pin ⑦ (PB, PAL)
50mV/div.
10μs/div.

㉔



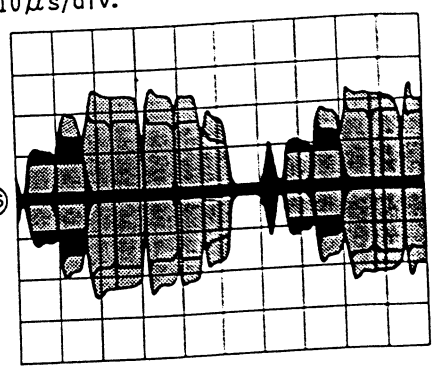
IC501 Pin ⑤ (PB, PAL)
200mV/div.
10μs/div.

(25)



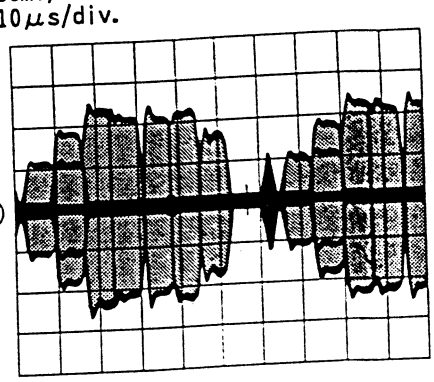
IC501 Pin ③ (PB, PAL)
50mV/div.
10μs/div.

(26)



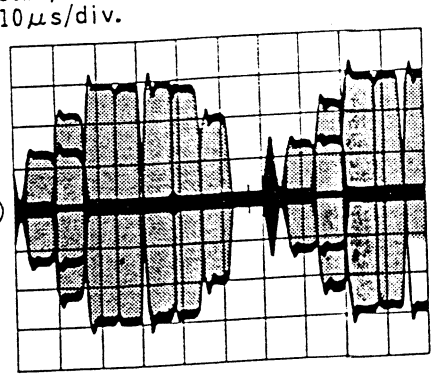
IC501 Pin ㉔ (PB, PAL)
50mV/div.
10μs/div.

(27)



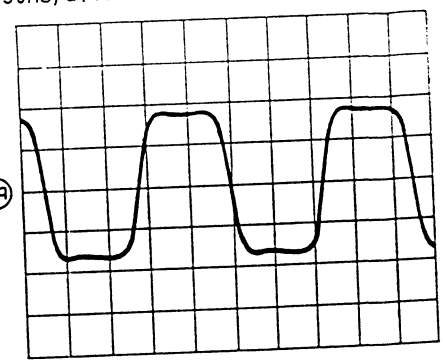
IC401 Pin ⑲ (PB, PAL)
50mV/div.
10μs/div.

(28)



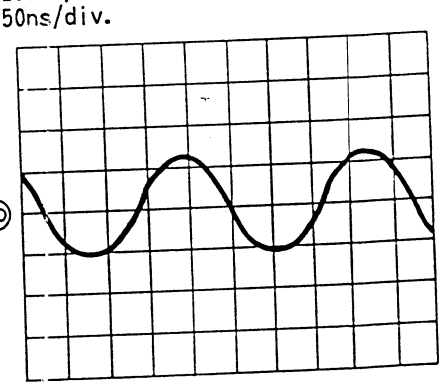
IC501 Pin ⑱ (PB, PAL)
200mV/div.
50ns/div.

(29)



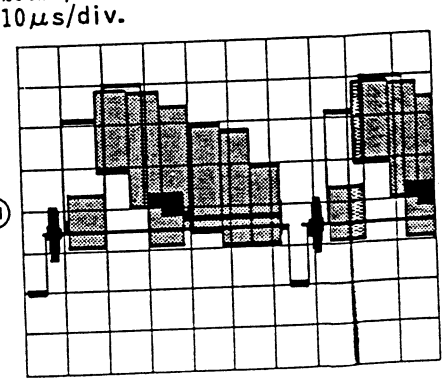
IC501 Pin ⑲ (PB, PAL)
200mV/div.
50ns/div.

(30)



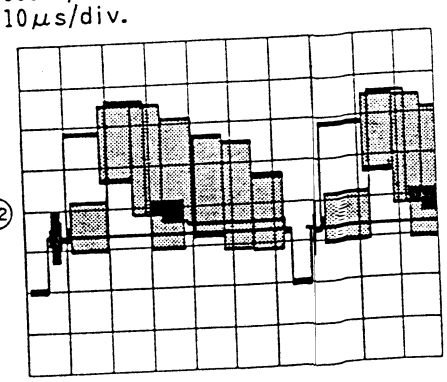
LINE IN (EE, NTSC)
200mV/div.
10μs/div.

(31)



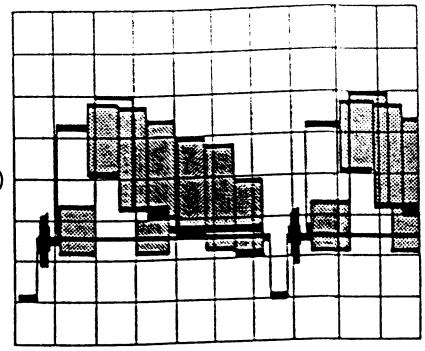
IC401 Pin ㉑ (EE, NTSC)
500mV/div.
10μs/div.

(32)



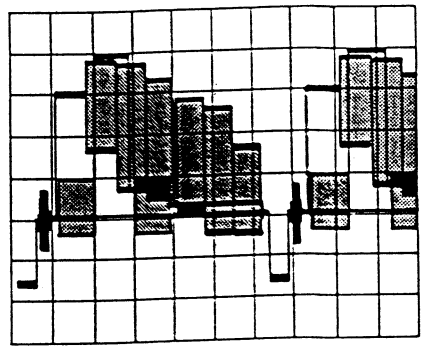
LINE OUT (EE, NTSC)
200mV/div.
10μs/div.

(33)



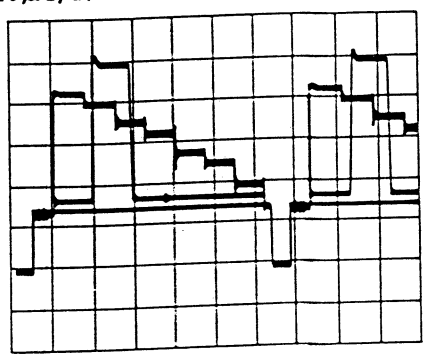
IC401 Pin ⑦ (EE, NTSC)
200mV/div.
10μs/div.

(34)



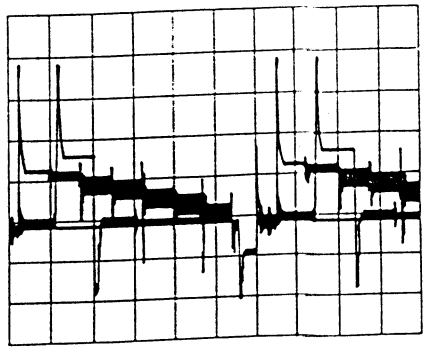
IC401 Pin ⑥ (EE, NTSC)
100mV/div.
10μs/div.

(35)



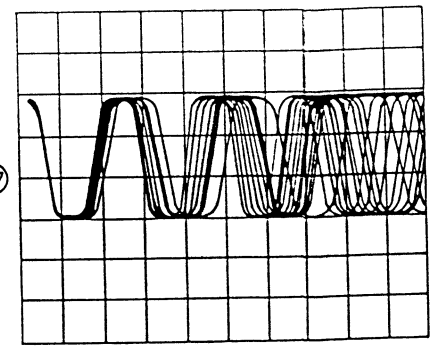
IC401 Pin ② (EE, NTSC)
200mV/div.
10μs/div.

(36)



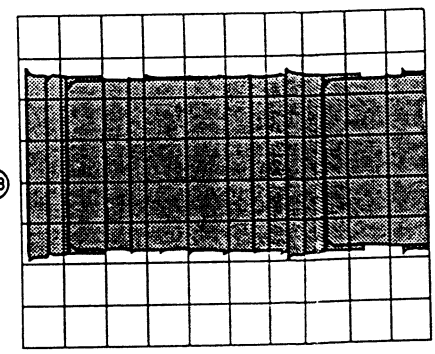
IC401 Pin ㉚ (EE, NTSC)
500mV/div.
100ns/div.

(37)



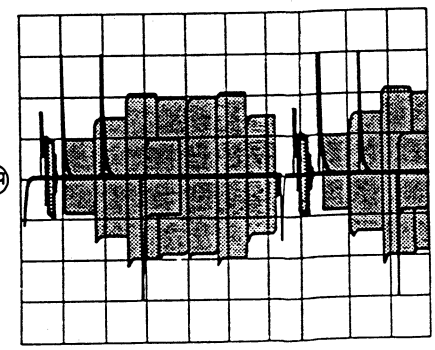
CN401 Pin ⑤ (EE, NTSC)
100mV/div.
10μs/div.

(38)



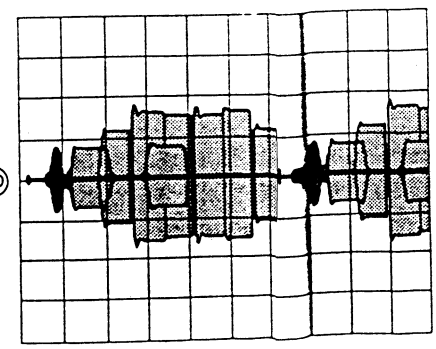
IC501 Pin ⑤ (EE, NTSC)
100mV/div.
10μs/div.

(39)



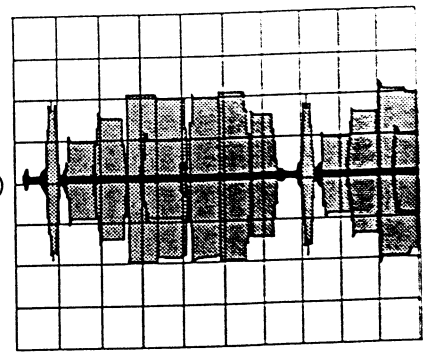
IC501 Pin ③ (EE, NTSC)
50mV/div.
10μs/div.

(40)



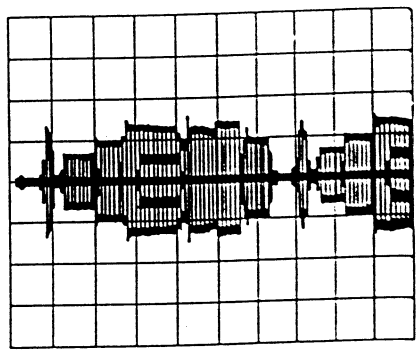
IC501 Pin ⑨ (EE, NTSC)
200mV/div.
10μs/div.

(41)



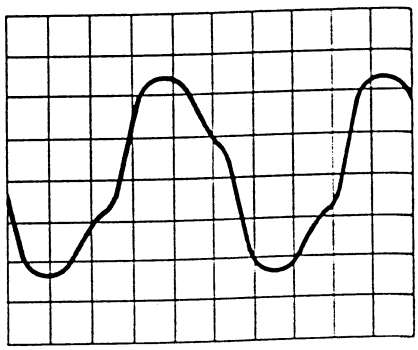
CN401 Pin ⑧ (EE, NTSC)
50mV/div.
100μs/div.

(42)



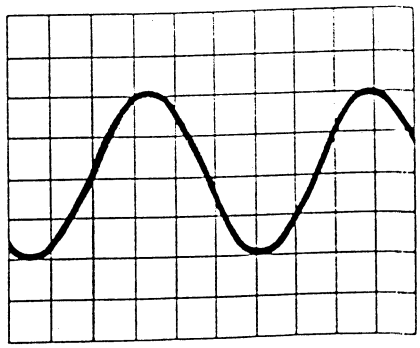
IC501 Pin ⑱ (EE, NTSC)
200mV/div.
50ns/div.

(43)



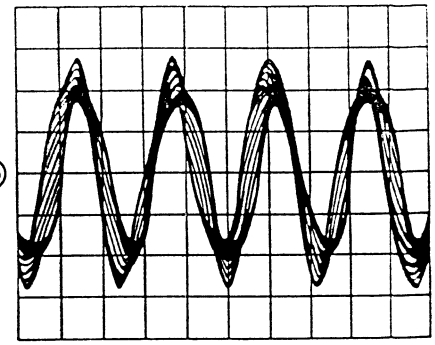
IC501 Pin ⑲ (EE, NTSC)
200mV/div.
50ns/div.

(44)



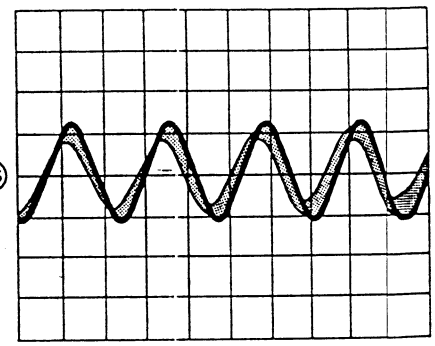
IC501 Pin ⑬ (EE, NTSC)
50mV/div.
100ns/div.

(45)



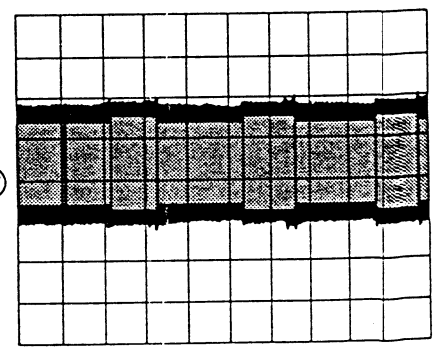
IC501 Pin ⑪ (EE, NTSC)
50mV/div.
100ns/div.

(46)



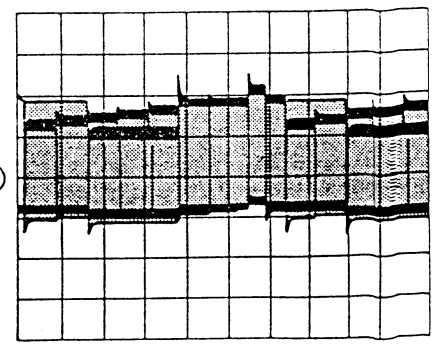
CN401 Pin ③ (PB, NTSC)
100mV/div.
5ms/div.

(47)

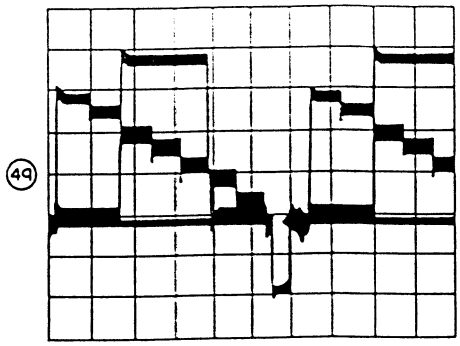


IC401 Pin ⑦ (PB, NTSC)
500mV/div.
10μs/div.

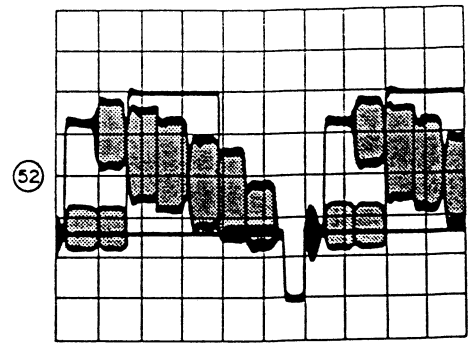
(48)



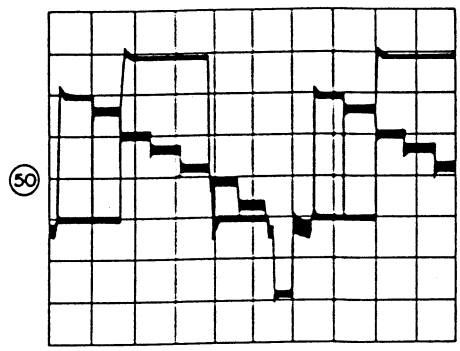
IC401 Pin ⑨ (PB, NTSC)
100mV/div.
10μs/div.



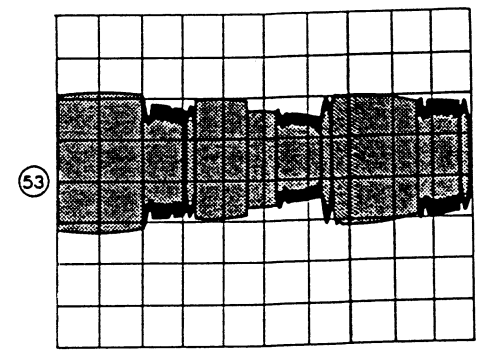
LINE OUT (PB, NTSC)
200mV/div.
10μs/div.



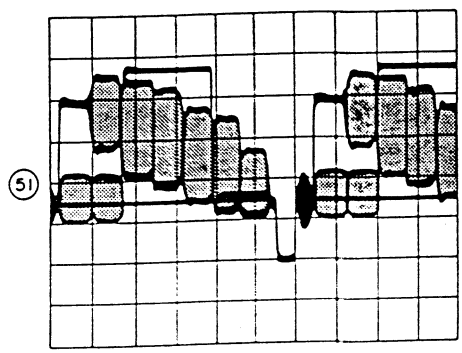
IC401 Pin ⑩ (PB, NTSC)
100mV/div.
10μs/div.



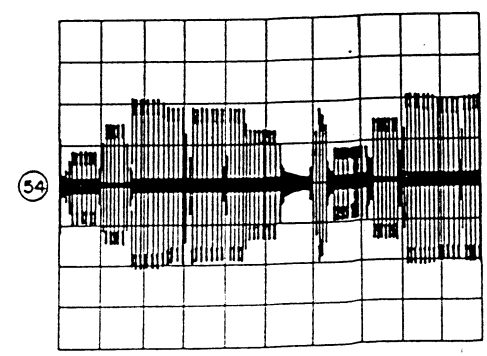
CN401 Pin ⑥ (PB, NTSC)
100mV/div.
5ms/div.



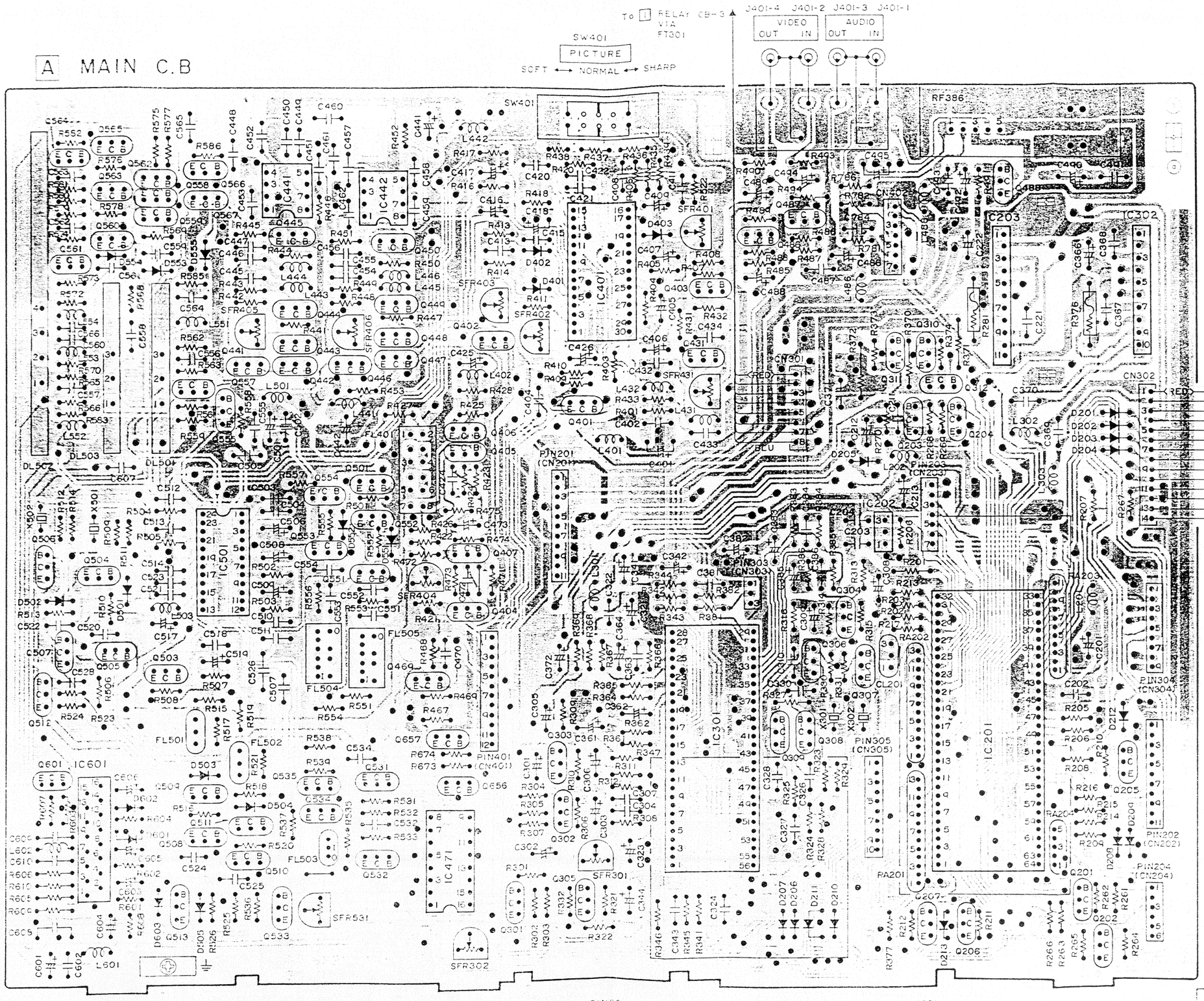
IC401 Pin ㉑ (PB, NTSC)
500mV/div.
10μs/div.



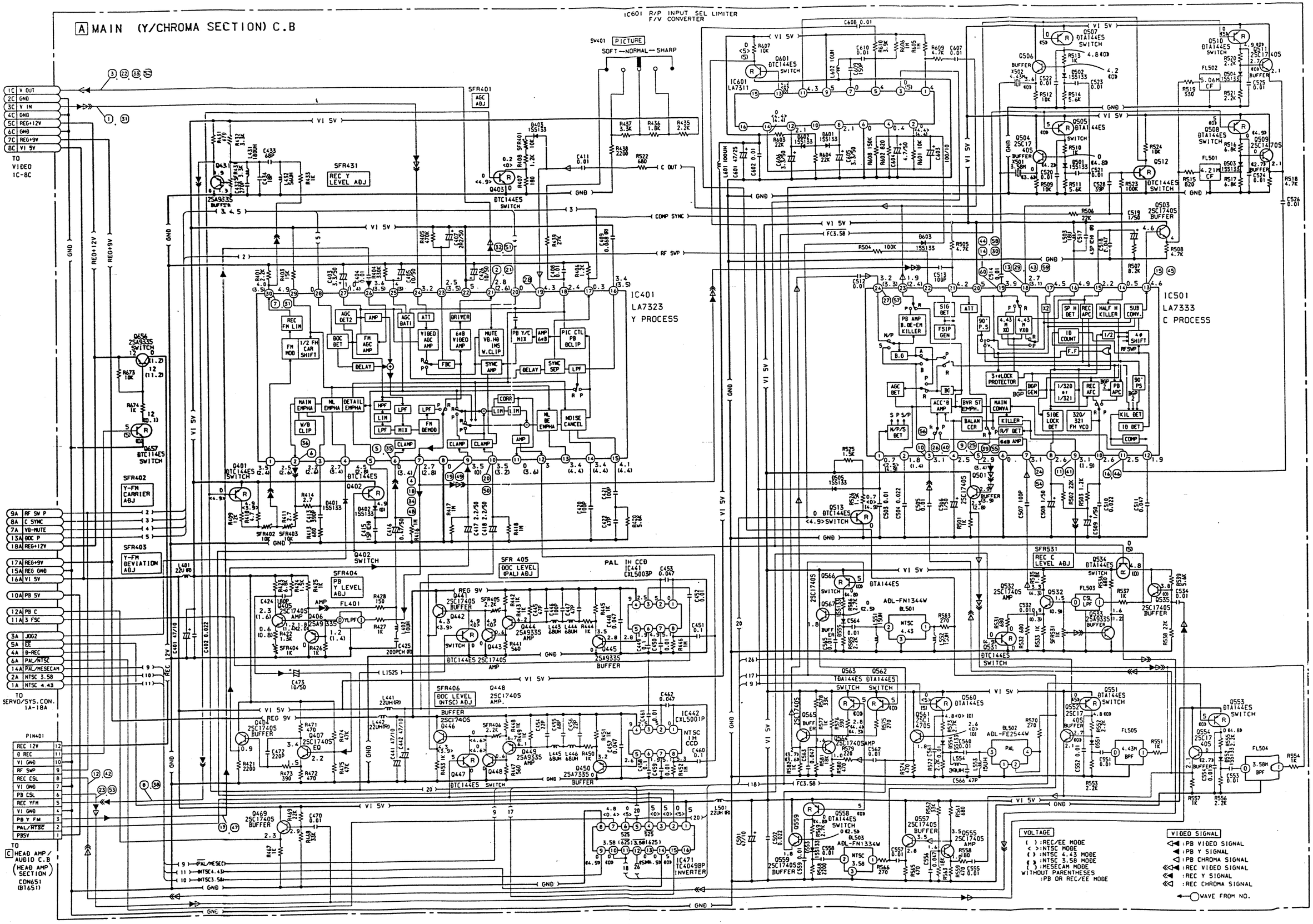
IC501 Pin ⑦ (PB, NTSC)
50mV/div.
10μs/div.

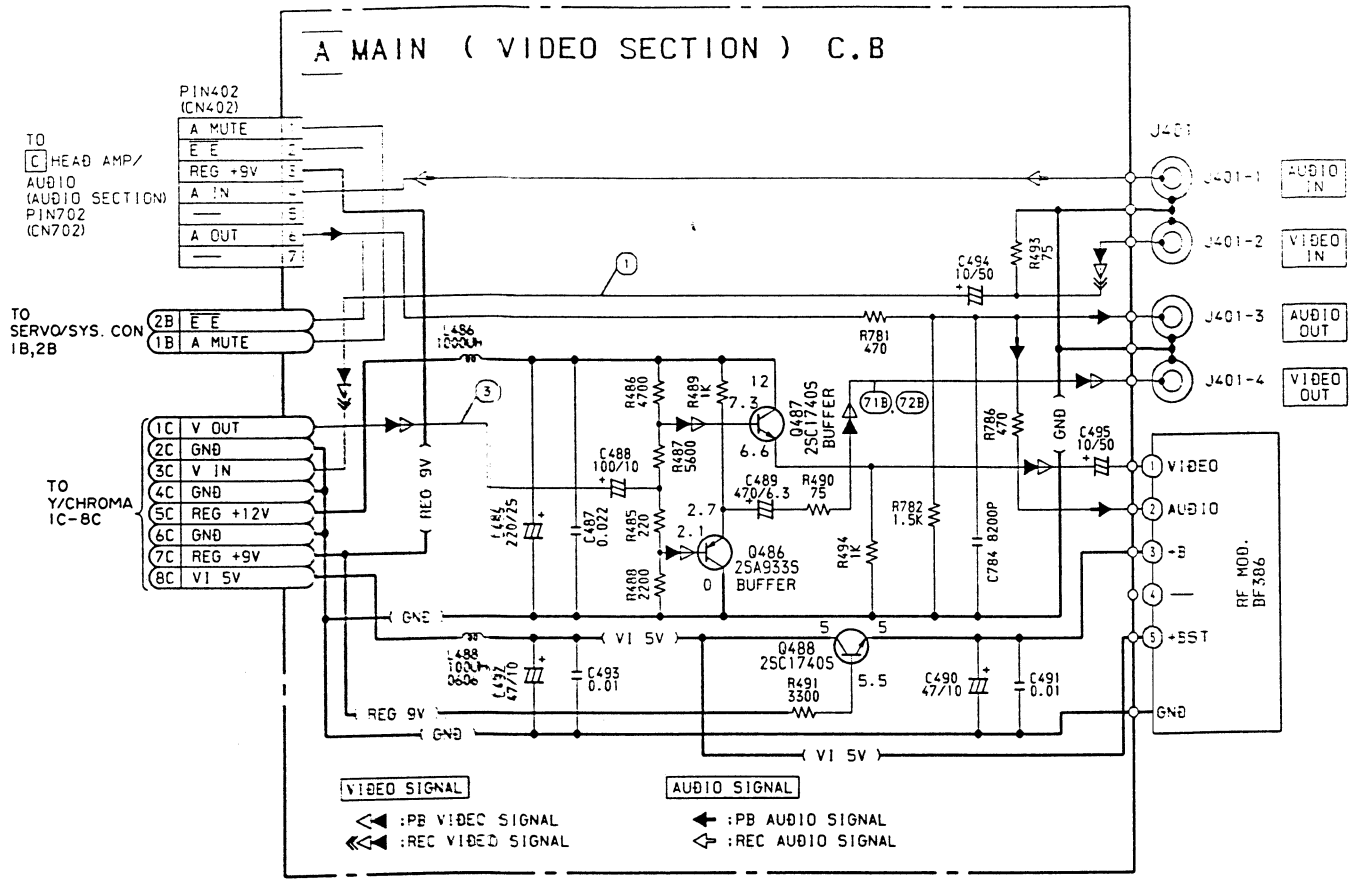


A MAIN C.B


SW401
PICTURE
SOFT ↔ NORMAL ↔ SHARP
To I RELAY C.B-3 VIA FT301
J401-4 J401-2 J401-3 J401-1
VIDEO OUT IN
AUDIO OUT IN
RF386
CHANNEL
30 39
RF OUT
G K
SYSTEM AERIAL
PIN402 (CN402)
YEL
GRY
GRY
WHT
GRY
WHT
GRY
To C HEAD AMP/AUDIO C.B PIN702 (CN702) VIA CON702
To B FRONT C.B CON902 (BT902)
PIN203 (CN203)
To H RELAY C.B-2 VIA FT302
To D AUTO TRACKING C.B CON951 (BT951)
To B FRONT C.B CON901 (BT901)
To K RELAY C.B-5 CON251 (BT251)
IC401
IC301
IC201
IC601
IC471
IC501
PIN401 (CN401)
PIN201 (CN201)
PIN303 (CN303)
PIN305 (CN305)
GRAPHIC SYMBOLS PRINTED CIRCUIT BOARD OF ELECTRICAL PARTS ARE DESIGNED AS NEGATIVE POLE.

SCHEMATIC DIAGRAM — 1 (VIDEO SECTION)

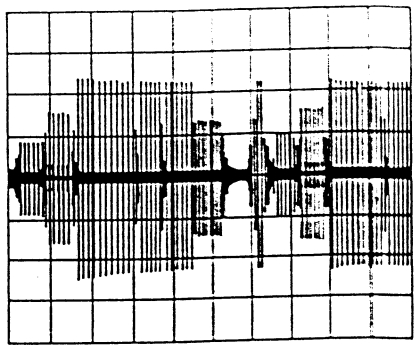



A MAIN (VIDEO SECTION) C.B
PIN402
(CN402)
A MUTE
REG +9V
A IN
A OUT
TO
C HEAD AMP/
AUDIO
(AUDIO SECTION)
PIN702
(CN702)
TO
SERVO/SYS. CON
1B,2B
2B E E
1B A MUTE
TO
Y/CHROMA
IC-8C
1C V OUT
2C GND
3C V IN
4C GND
5C REG +12V
6C GND
7C REG +9V
8C VI 5V
J401
J401-1 AUDIO IN
J401-2 VIDEO IN
J401-3 AUDIO OUT
J401-4 VIDEO OUT
VIDEO
AUDIO
+B
+5ST
GND
RF MOD.
DF386
Q487
2SC1740S
BUFFER
Q486
2SA933S
BUFFER
Q488
2SC1740S
REG 9V
GND
VI 5V
VIDEO SIGNAL
:PB VIDEO SIGNAL
:REC VIDEO SIGNAL
AUDIO SIGNAL
:PB AUDIO SIGNAL
:REC AUDIO SIGNAL

WAVE FORM — 2 (VIDEO SECTION)

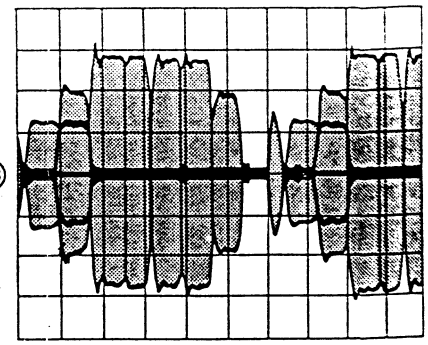
IC501 Pin ⑤ (PB, NTSC)
200mV/div.
10μs/div.

(55)



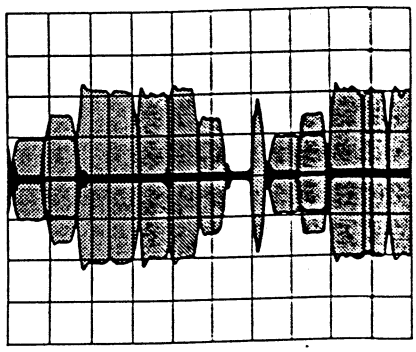
IC401 Pin ⑲ (PB, NTSC)
50mV/div.
10μs/div.

(58)



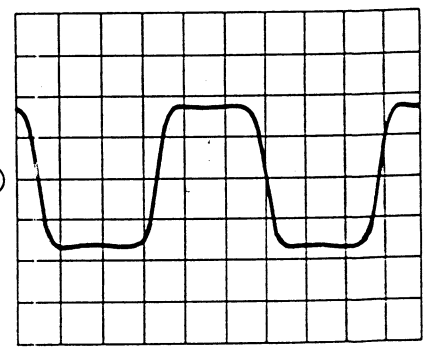
IC501 Pin ③ (PB, NTSC)
50mV/div.
10μs/div.

(56)



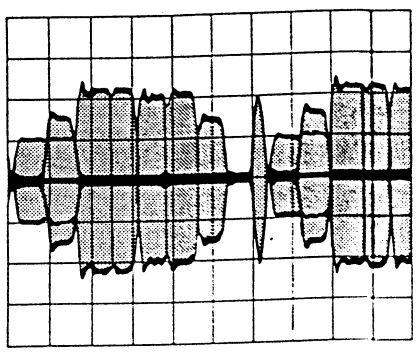
IC501 Pin ⑱ (PB, NTSC)
200mV/div.
50ns/div.

(59)



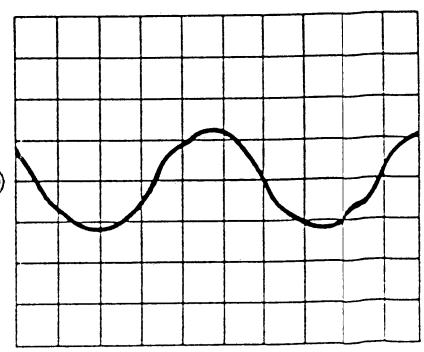
IC501 Pin ㉔ (PB, NTSC)
50mV/div.
10μs/div.

(57)



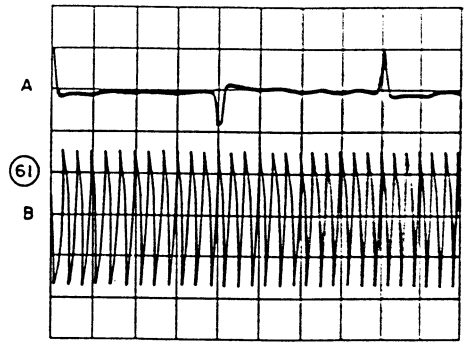
IC501 Pin ⑲ (PB, NTSC)
200mV/div.
50ns/div.

(60)

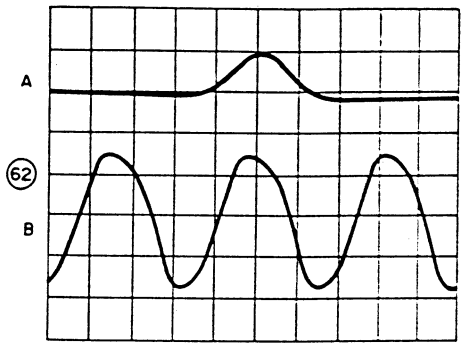


WAVE FORM — 3 (SERVO SECTION)

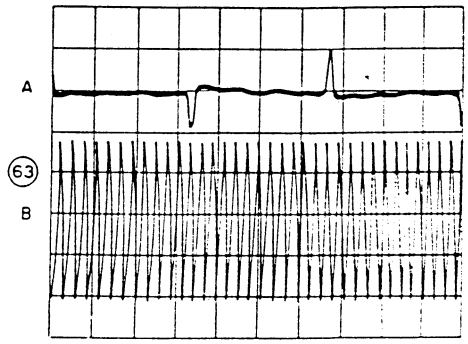
1. DRUM PG AND FG
Upper: DRUM PG AC 2V/div.
(IC301 Pin ⑦)
Lower: DRUM FG AC 500mV/div.
(IC301 Pin ⑨)
TIME 5ms/div.



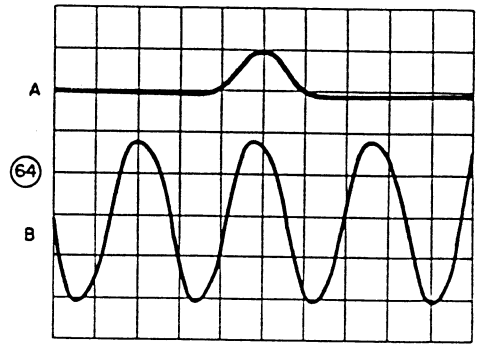
2. DRUM PG AND FG (PAL, MESECAM)
Upper: DRUM PG AC 2V/div.
(IC301 Pin ⑦)
Lower: DRUM FG AC 500mV/div.
(IC301 Pin ⑨)
TIME 500μs/div.
The PG pulse (upper) is generated (either positive or negative) when the FG pulse (lower)is a positive half wave.



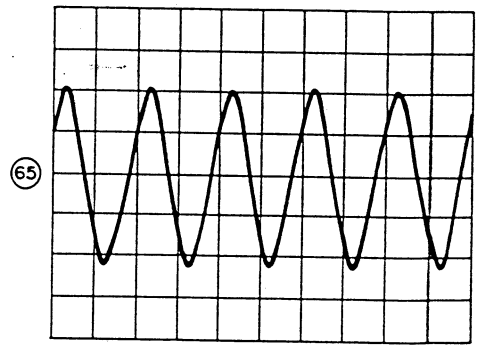
3. DRUM PG AND FG (NTSC 3.58, NTSC 4.43)
Upper: DRUM PG AC 2V/div.
(IC301 Pin ⑦)
Lower: DRUM FG AC 500mv/div.
(IC301 Pin ⑨)
Time 5ms/div.



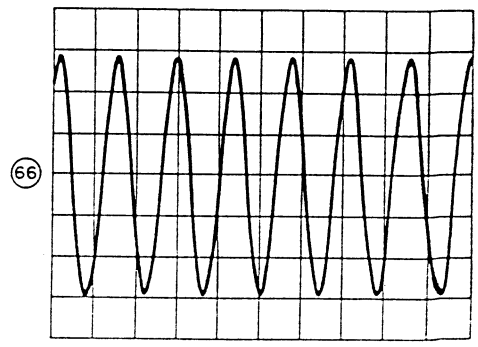
4. DRUM PG AND FG (NTSC 3.58, NTSC 4.43)
Upper: DRUM PG AC 2V/div.
(IC301 Pin ⑦)
Lower: DRUM FG AC 500mV/div.
(IC301 Pin ⑨)
Time 500μs/div.
The PG pulse (upper) is generated (either positive negative) when the FG pulse (lower) is a positive half wave.



5. CAPSTAN FG (PAL, MESECAM)
(IC301 Pin ㊲)
AC 500mV/div.
1ms/div.

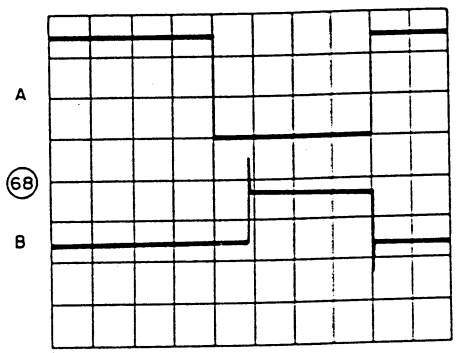


6. CAPSTAN FG (NTSC 3.58, NTSC 4.43)
(IC301 Pin ㊲)
AC 500mV/div.
1ms/div.

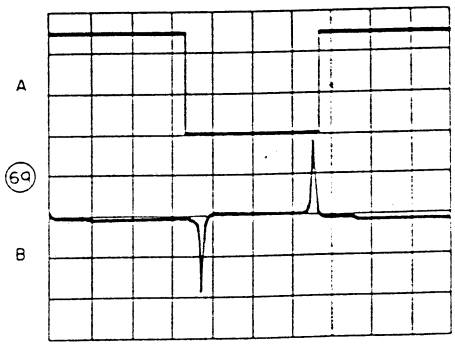


7. RF SWP AND PB CTL (PAL, MESECAM)
Upper: RF SWP DC 2V/div.
(IC301 Pin (45))
Lower: PB CTL AC 500mV/div.
(TP CTL)
Time 5ms/div.
(The PB CTL pulse is preset position.)

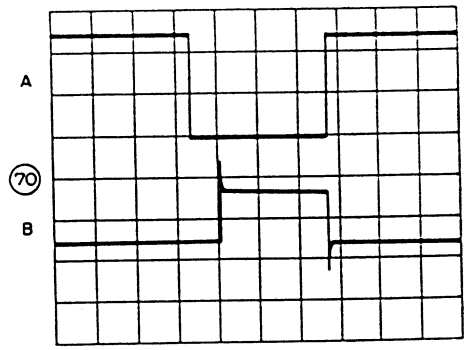
8. RF SWP AND REC CTL (PAL, MESECAM)
Upper: RF SWP DC 2V/div.
(IC301 Pin (45))
Lower: REC CTL AC 2V/div.
(TP REC CTL)
Time 5ms/div.



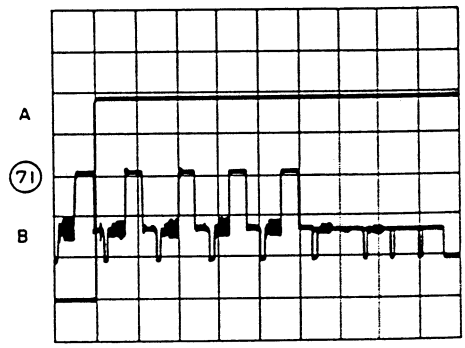
9. RF SWP AND PB CTL (NTSC 3.58, NTSC 4.43)
Upper: RF SWP DC 2V/div.
(IC301 Pin (45))
Lower: PB CTL AC 500mV/div.
(TP CTL)
Time 5ms/div.
(The PB CTL pulseis preset position)



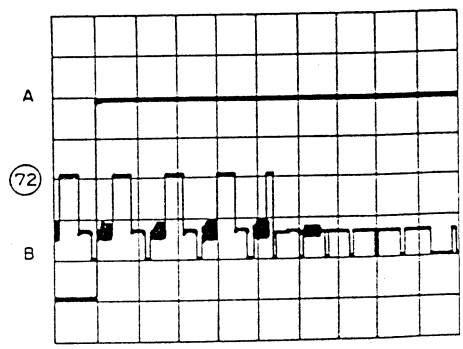
10. RF SWP AND REC CTL (NTSC 3.58, NTSC 4.43)
Upper: RF SWP DC 2V/div.
(IC301 Pin (45))
Lower: REC CTL AC 2V/div.
(TP REC CTL)
Time 5ms/div.



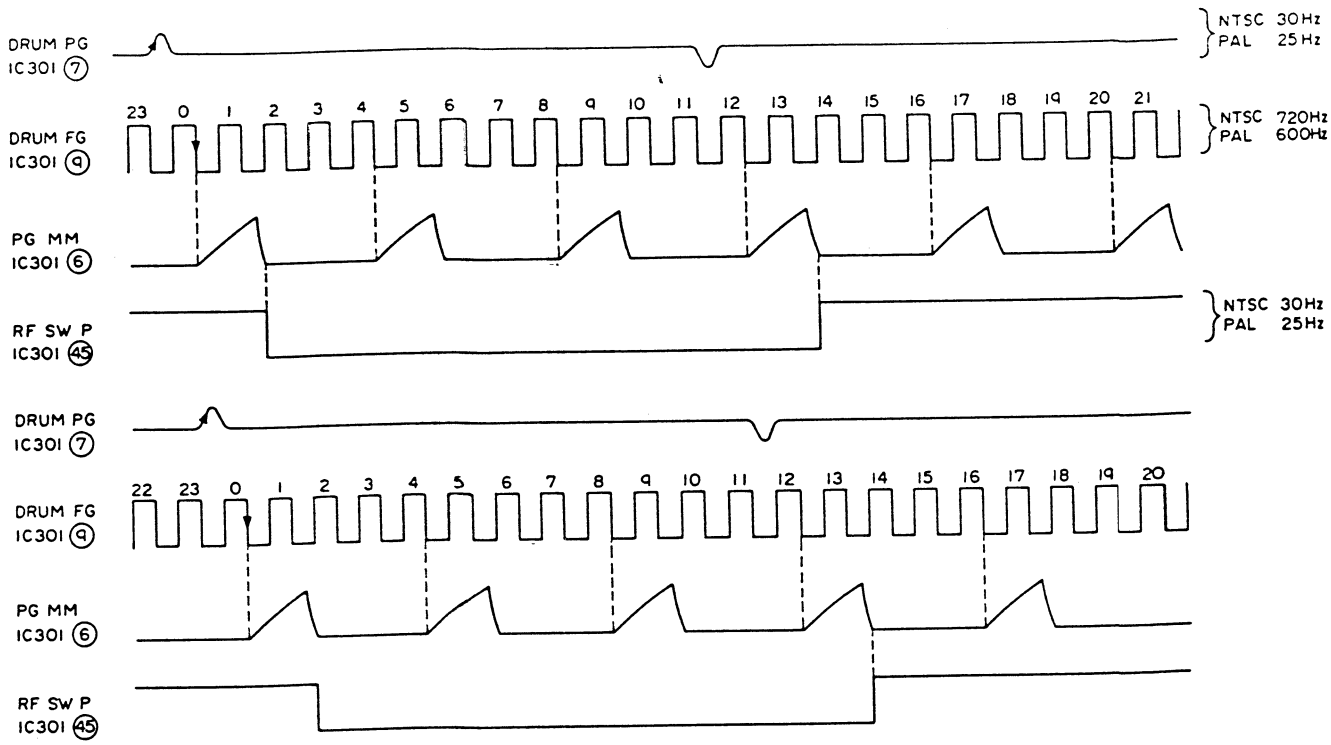
11. RF SWP AND VIDEO OUT (PAL, MESECAM)
Upper: RF SWP DC 1V/div.
(IC301 Pin (45))
Lower: VIDEO OUT (at open)
AC 1V/div.
Time 50μs/div.



12. RF SWP AND VIDEO OUT (NTSC 3.58, NTSC 4.43)
Upper: RF SWP DC 1V/div.
(IC301 Pin (45))
Lower: VIDEO OUT (at open)
AC 1V/div.
Time 50μs/div.

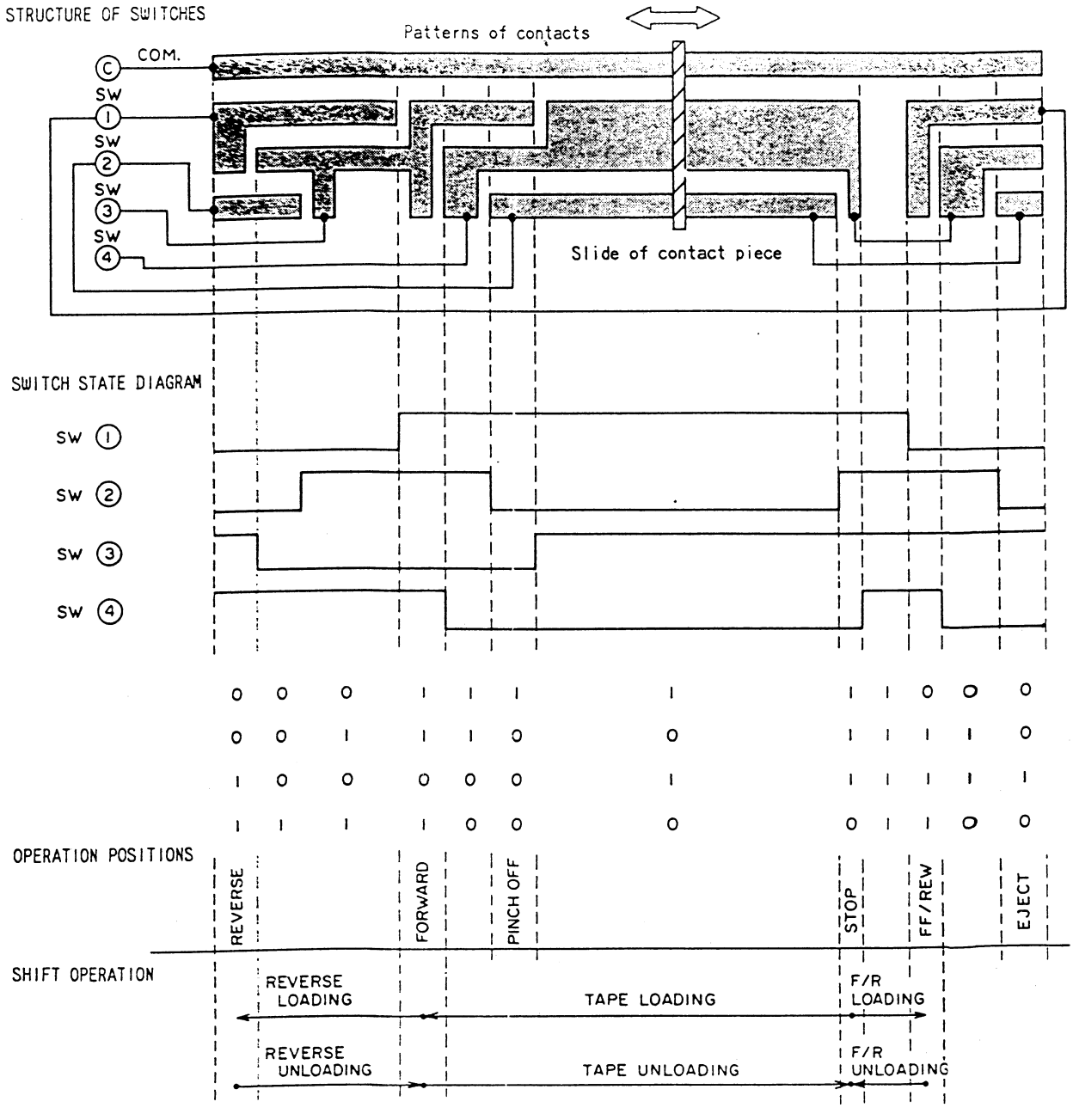


DRUM SERVO SYSTEM TIMING CHART



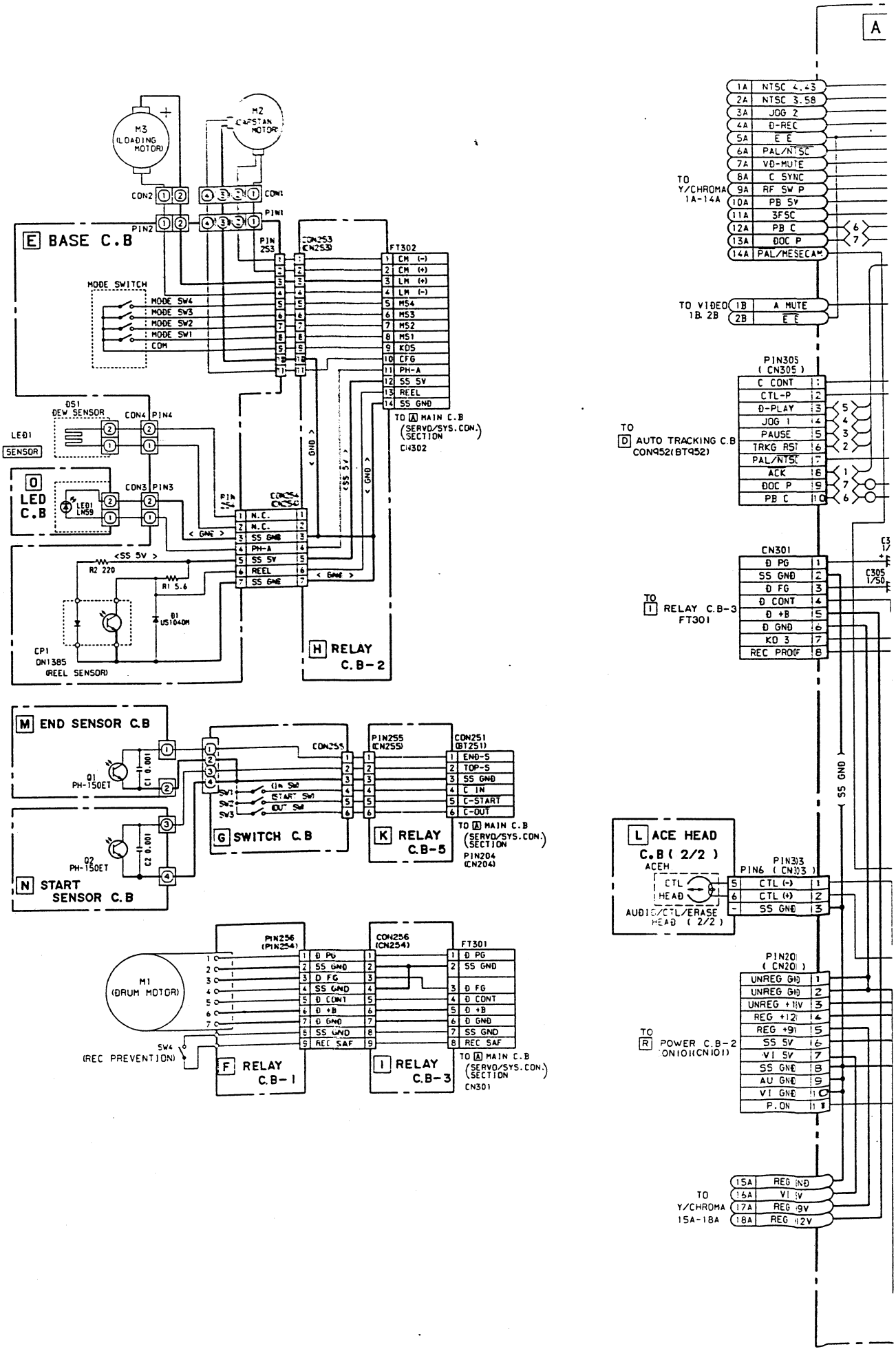
SYSTEM SWITCH MODE

※When SYSTEM CONTROL IC has run away SYSTEM CONTROL IC will not accept any mode.

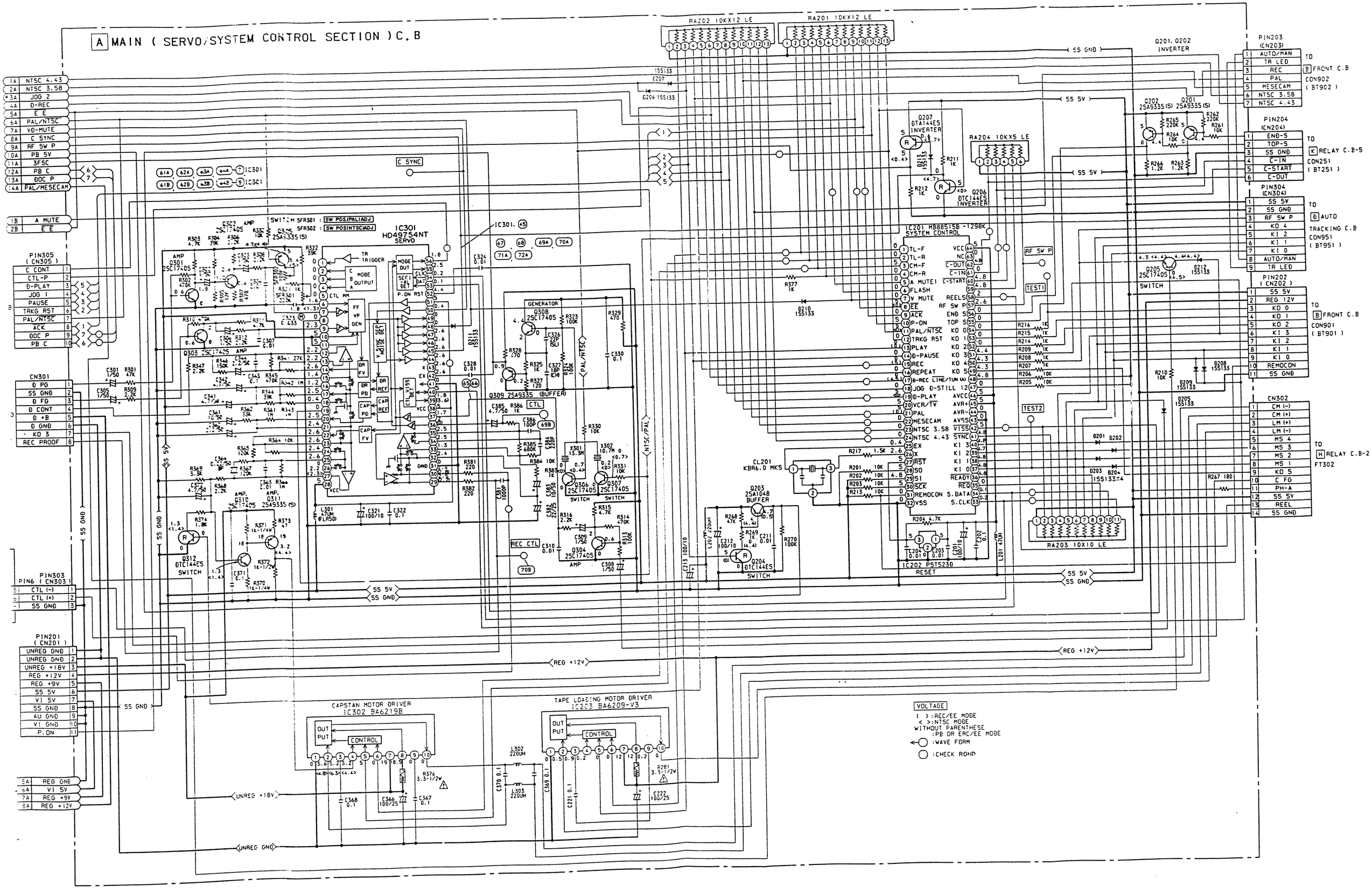


SWITCH				Position
SW1	SW2	SW3	SW4	
0	0	1	0	Front loading, Eject
0	1	1	0	Intermediate
0	1	1	1	F.F, REW
1	1	1	1	Intermediate
1	1	1	0	Stop
1	0	1	0	Tape loading
1	0	0	0	Gear change
1	1	0	0	Intermediate
1	1	0	1	Play (Pause)
0	1	0	1	Intermediate
0	0	0	1	Intermediate
0	0	1	1	Reset

SCHEMATIC DIAGRAM — 2 (SERVO/SYSTEM CONTROL SECTION)



A MAIN (SERVO/SYSTEM CONTROL SECTION) C.B



IC DESCRIPTION – 1

IC,HD40430A21S

Pin No.	Pin Name	I/O	Description
1	KA/$\overline{M}$	O	Outputs a signal which designates the auto or manual status to the mechanism microprocessor.
2	TR. CLK	O	Clock output for transferring tracking data.
3	TR. DATA	O	Playback tracking data output.
4	——	–	Fixed at "L".
5	A/D POS	O	Signal to indicate timing of V LEV A/D conversion.
6	$\overline{\text{NLOCK}}$	O	Signal to indicate that the Noise bar is out of the screen.
7	$\overline{\text{D RST}}$	O	Outputs a reset pulse to the noise cancel circuit to detect the position of noise.
8	TR LED	O	Outputs a tracking LED control signal.
9	——	–	Fixed at "H".
10	T MODE	I	Test mode signal input. ("H" in the test mode)
11	AUTO/$\overline{\text{MAN}}$	I	Auto tracking ON/OFF signal. ("H" in the auto mode)
12	$\overline{\text{ACK}}$	I	Signal to indicate whether or not the playback tracking data is transferred correctly.
13	A/D OUT 1	O	V LEV A/D converted value output 2^0. (LSB)
14	A/D OUT 2	O	V LEV A/D converted value output 2^1.
15	A/D OUT 3	O	V LEV A/D converted value output 2^2.
16	A/D OUT 4	O	V LEV A/D converted value output 2^3.
17	A/D OUT 5	O	V LEV A/D converted value output 2^4.
18	——	–	Fixed at "L".
19	RF SWP	I	Head switching signal.
20	DOC P	I	Receives the noise position detection signal for the noise cancel circuit.
21	GND	–	Ground.
22	AVCC	–	Power supply of A/D converter. (+5V)
23	V LEV	I	Signal to detect the video level. (analog DC)
24	——	–	} Fixed at "L".
25	——	–	
26	——	–	
27	AVSS	–	Power supply of A/D converter. (Connected to Ground)
28	TRKG RST	I	Reset signal. ("H" when reset)
29	——	–	Fixed at "H".
30	X	–	} Connected to a clock generator.
31	EX	–	
32	VCC	–	Power supply. (+5V)
33	ET/$\overline{\text{BT}}$	I	Fixed at "H".
34	PAL/$\overline{\text{NTSC}}$	I	PAL,NTSC switching signal. ("H" for PAL)
35	PAUSE	I	Detects "H" in the STILL mode to cancel noise.
36	JOG	I	"H" is input during CUE and REV.
37	D-PB	I	"H" is input during PLAY.
38	CTL P	I	Shaped CTL pulse input.
39	C CONT	O	Outputs a noise feed pulse to cancel noise.
40	A/D OUT 6	O	V LEV A/D converted value output 2^5.
41	A/D OUT 7	O	V LEV A/D converted value output 2^6.
42	A/D OUT 8	O	V LEV A/D converted value output 2^7. (MSB)

GRAPHIC SYMBOLS PRINTED CIRCUIT BOARD OF ELECT. CAP. ARE DESIGNED AS NEGATIVE POLE.
(プリント基板内のケミコンの極性表示は⊖表示です。)

C HEAD AMP/ AUDIO C.B

D AUTO TRACKING C.B

H RELAY C.B-2

P ERASE HEAD C.B

J RELAY C.B-4

I RELAY C.B-3

L ACE HEAD C.B

N START SENSOR C.B

F RELAY C.B-1

M END SENSOR C.B

E BASE C.B

B FRONT C.B

G SWITCH C.B

O LED C.B

K RELAY C.B-5

D AUTO TRACKING C.B

IC 951 HD4043C2A21S
AUTO TRACKING

Q956~Q958
SWITCHING

CON951
(BT 951)

SS 5V	1
SS GND	2
RF SW P	3
KO 4	4
KI 2	5
KI 1	6
KI 0	7
AUTO/MAN	8
TR LED	9

TO A MAIN C.B
(SERVO/SYS.CON. SECTION
PIN304
(CN304)

CON952
(BT 952)

1	C CONT
2	CTL P
3	D-PLAY
4	JOG 1
5	PAUSE
6	TRKG RST
7	PAL/NTSC
8	ACK
9	DOC P
10	PB C

TO A MAIN C.B
(SERVO/SYS.CON. SECTION
PIN305
(CN305)

IC952
WAVEFORM
SHAPING

IC952 (3/4)
TC4011BP

IC952 (4/4)
TC4011BP

IC952 (2/4)
TC4011BP
INVERTER

IC952 (1/4)
TC4011BP
INVERTER

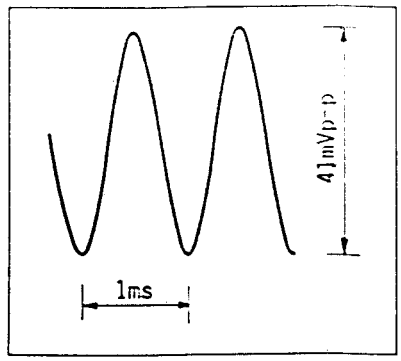
VOLTAGE

( ) : REC/EE MODE
< > : NTSC MODE
WITHOUT PARENTHESES : PB OR REC/EE MODE
○ : CHECK RAND

WAVE FORM – 4 (AUDIO SECTION)

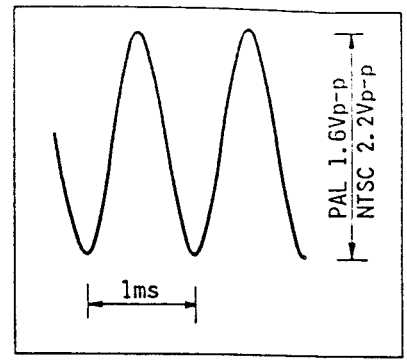
IC701 Pin ㉕
REC Mode

⑮



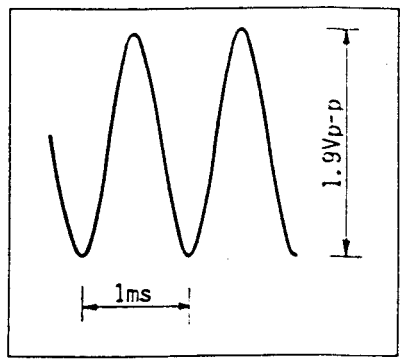
IC701 Pin ⑳
REC Mode

⑲



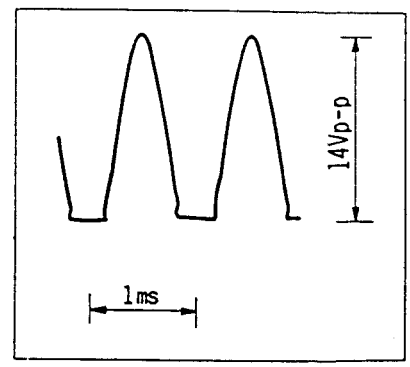
IC701 Pin ㉚
REC Mode

⑯



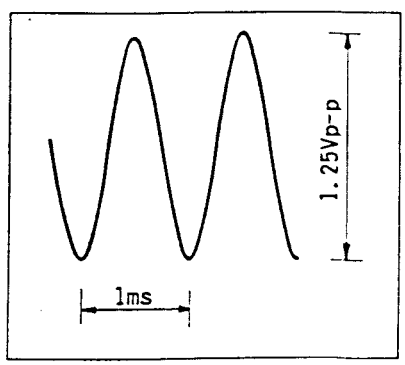
T741 Pin ①
REC Mode

⑳



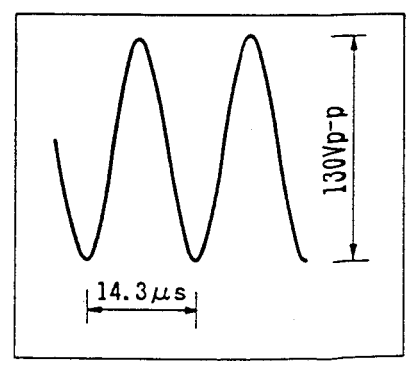
Q721 Collector
REC Mode

⑰



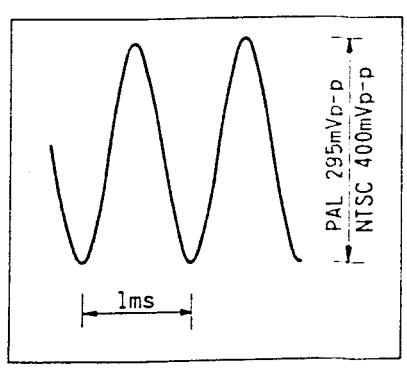
T741 Pin ⑥
REC Mode

㉑



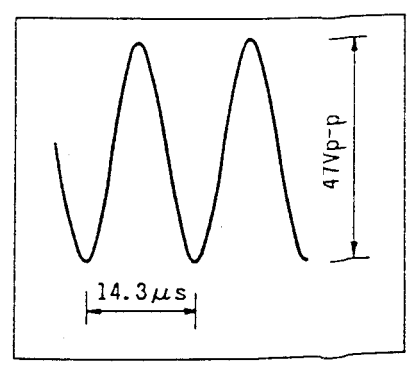
IC701 Pin ㉔
REC Mode

⑱



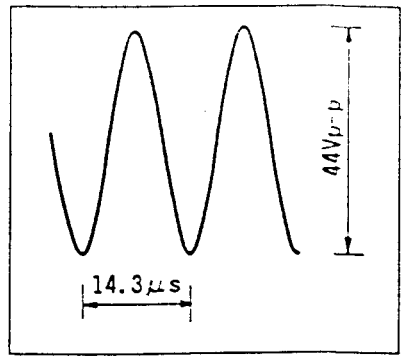
T741 Pin ⑤
REC Mode

㉒



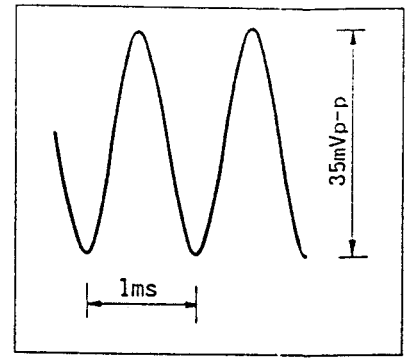
T741 Pin ④
REC Mode

⑬



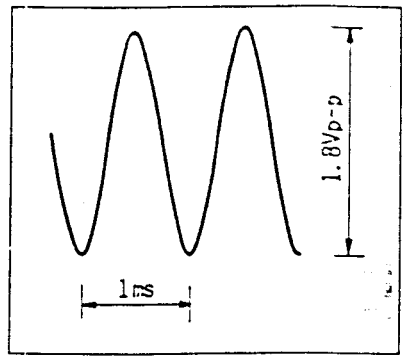
IC701 Pin ㉓
PB Mode

㊲



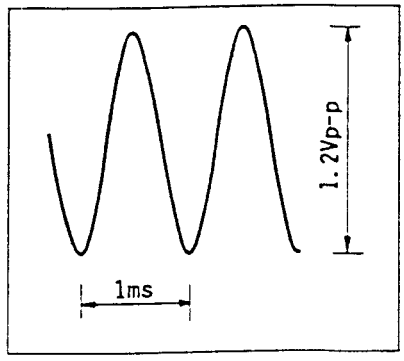
IC701 Pin ㉚
PB Mode

㊴



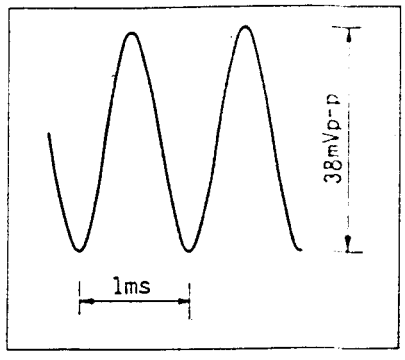
Q721 Collector
PB Mode

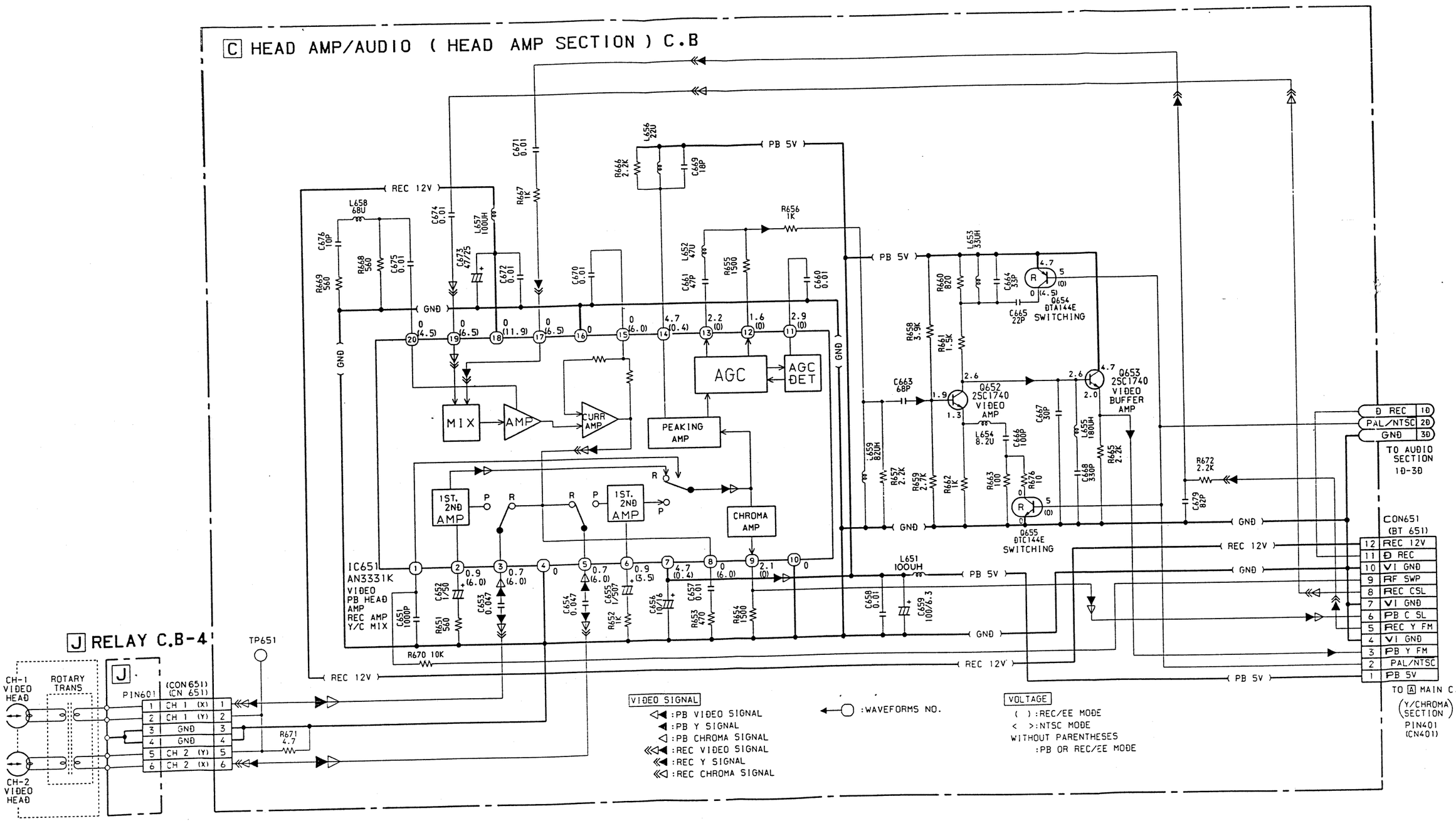
㊵

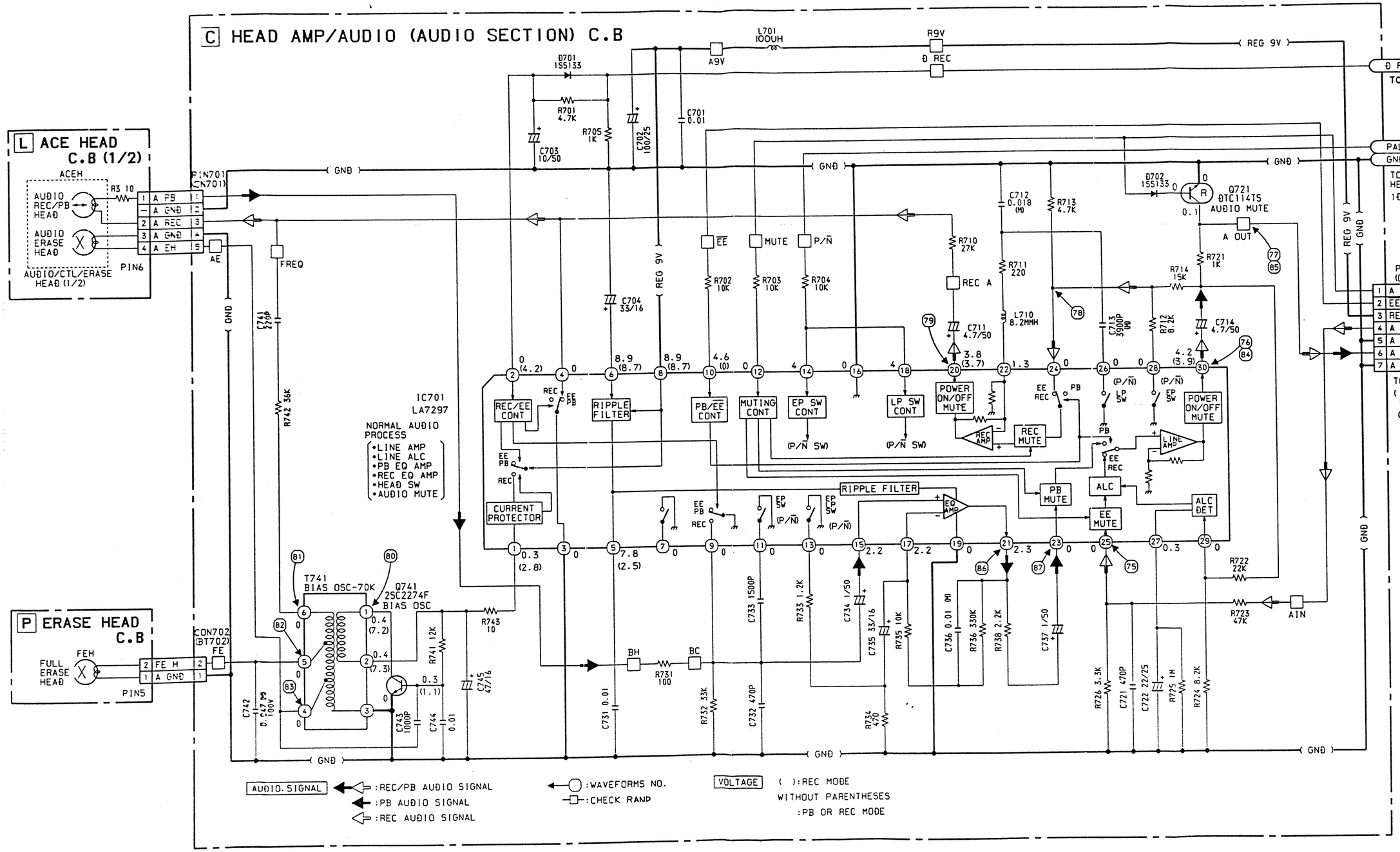


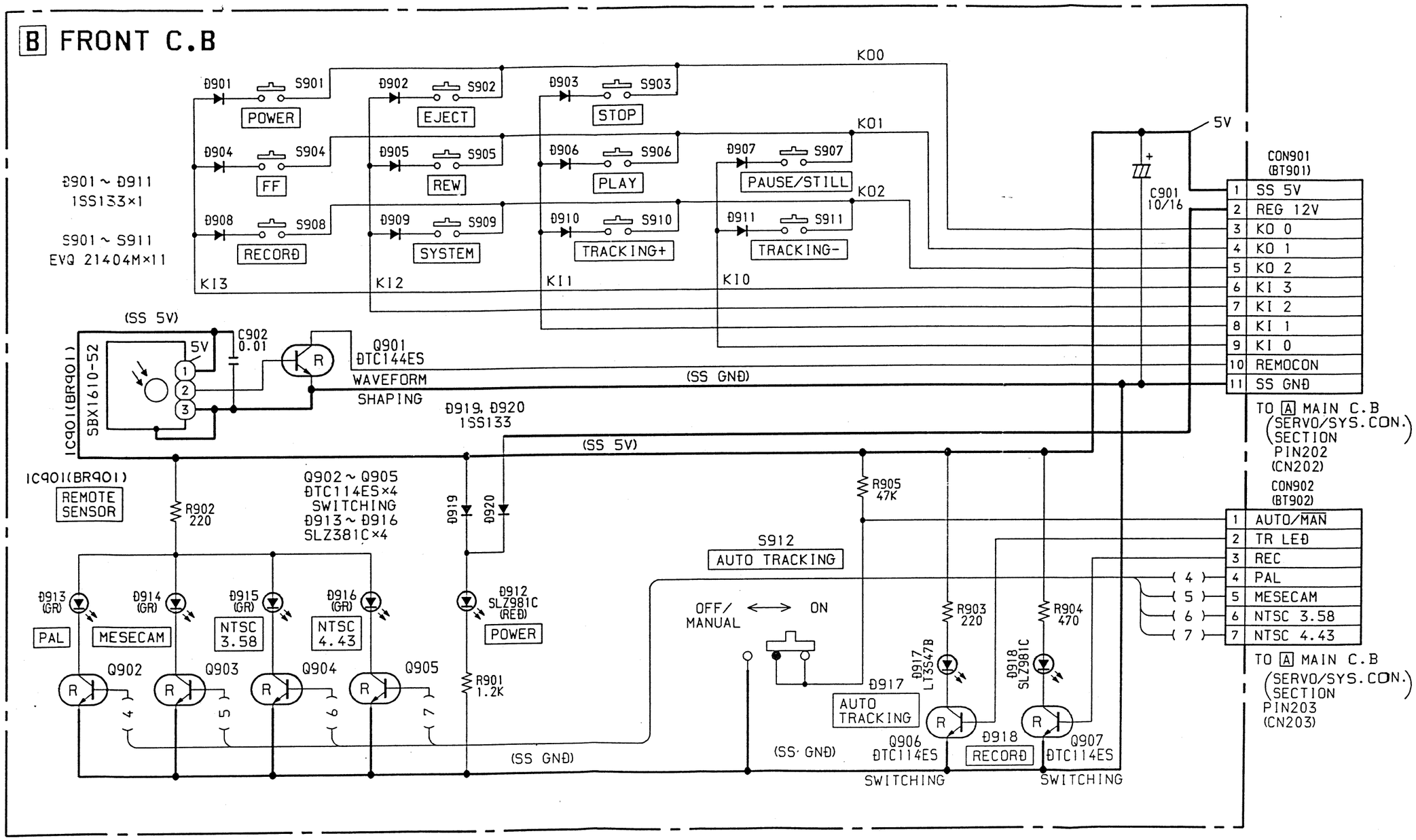
IC701 Pin ㉑
PB Mode

㊶



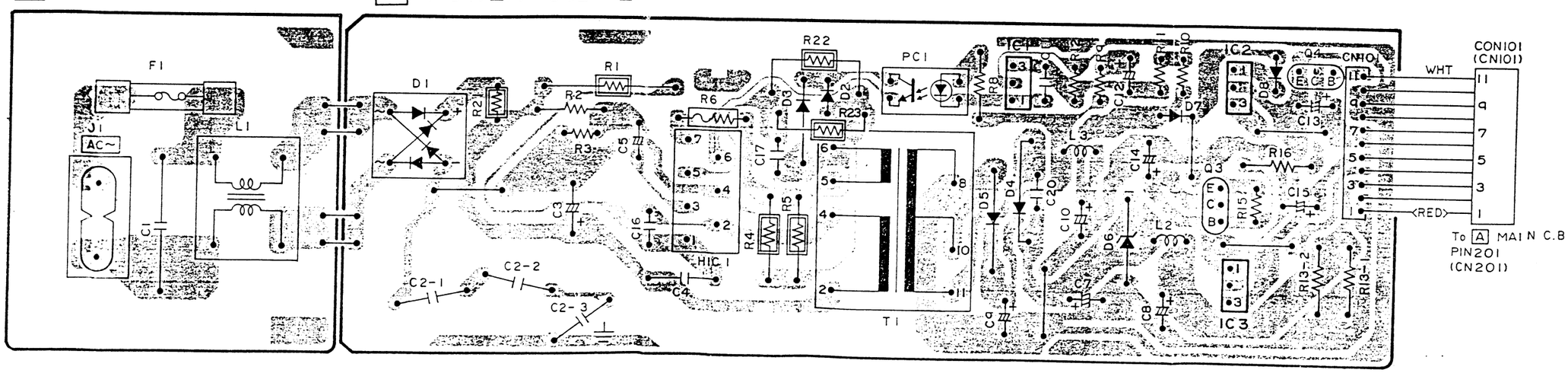

C HEAD AMP/AUDIO (HEAD AMP SECTION) C.B
REC 12V
PB 5V
GND
L658 68U
C676 10P
R669 560
R668 560
C675 0.01
C674 0.01
L657 100UH
C673 47/25
C672 0.01
C671 0.01
R667 1K
C670 0.01
R648 2.2K
C669 18P
L656 220
R656 1K
L652 47U
C661 47P
R655 1500
C660 0.01
MIX
AMP
CURR AMP
PEAKING AMP
AGC
AGC DET
1ST. 2ND AMP
1ST. 2ND AMP
CHROMA AMP
IC651
AN3331K
VIDEO
PB HEAD AMP
REC AMP
Y/C MIX
C651 1000P
R651 560
C652 1/50
C653 0.047
C654 0.047
R652 1K
C655 1/50?
C656 10/16
R653 470
C657 0.01
R654 1500
R670 10K
L653 330H
R660 820
C664 33P
Q654 DTA144E SWITCHING
C665 22P
R658 3.9K
R661 1.5K
C663 68P
Q652 2SC1740 VIDEO AMP
Q653 2SC1740 VIDEO BUFFER AMP
L654 8.2U
C666 100P
C447 50P
L655 180UH
C668 330P
R665 2.2K
R672 2.2K
C679 82P
L659 82UH
R657 2.2K
R659 2.7K
R662 1K
R663 100
R676 10
Q655 DTC144E SWITCHING
L651 100UH
C658 0.01
C659 100/6.3
TP651
R671 4.7
J RELAY C.B-4
CH-1 VIDEO HEAD
ROTARY TRANS
CH-2 VIDEO HEAD
PIN601
(CON651) (CN 651)
1 CH 1 (X) 1
2 CH 1 (Y) 2
3 GND 3
4 GND 4
5 CH 2 (Y) 5
6 CH 2 (X) 6
Đ REC 1Đ
PAL/NTSC 2Đ
GNĐ 3Đ
TO AUDIO SECTION 1Đ-3Đ
CON651 (BT 651)
12 REC 12V
11 Đ REC
10 VI GNĐ
9 RF SWP
8 REC CSL
7 VI GNĐ
6 PB C SL
5 REC Y FM
4 VI GNĐ
3 PB Y FM
2 PAL/NTSC
1 PB 5V
TO A MAIN C.B (Y/CHROMA SECTION) PIN401 (CN401)
VIDEO SIGNAL
:PB VIDEO SIGNAL
:PB Y SIGNAL
:PB CHROMA SIGNAL
:REC VIDEO SIGNAL
:REC Y SIGNAL
:REC CHROMA SIGNAL
:WAVEFORMS NO.
VOLTAGE
( ):REC/EE MODE
< >:NTSC MODE
WITHOUT PARENTHESES
:PB OR REC/EE MODE


C HEAD AMP/AUDIO (AUDIO SECTION) C.B
L ACE HEAD C.B (1/2)
ACEH
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
AUDIO/CTL/ERASE HEAD (1/2)
PIN6
R3 10
PIN701 (CN701)
1 A PB 1
– A GND 2
2 A REC 3
3 A GND 4
4 A EH 5
AE
FREQ
GND
C741 220P
R742 36K
IC701 LA7297
NORMAL AUDIO PROCESS
•LINE AMP
•LINE ALC
•PB EQ AMP
•REC EQ AMP
•HEAD SW
•AUDIO MUTE
D701 1SS133
R701 4.7K
R705 1K
C703 10/50
C702 100/25
C701 0.01
L701 100UH
A9V
R9V
D REC
REG 9V
GND
C704 33/16
EE
MUTE
P/N
R702 10K
R703 10K
R704 10K
R710 27K
REC A
C712 0.018 (M)
R713 4.7K
L710 8.2MMH
C711 4.7/50
D702 1SS133
Q721 DTC114TS AUDIO MUTE
0.1
A OUT
R721 1K
R714 15K
C713 3900P (M)
R712 8.2K
C714 4.7/50
REC/EE CONT
RIPPLE FILTER
PB/EE CONT
MUTING CONT
EP SW CONT
LP SW CONT
POWER ON/OFF MUTE
REC AMP
REC MUTE
EE REC
PB
LP SW
EP SW
(P/N)
(P/N SW)
LINE AMP
CURRENT PROTECTOR
EQ AMP
PB MUTE
ALC
EE MUTE
ALC DET
R722 22K
R723 47K
AIN
TO HEAD AMP SECTION
D REC 19
PAL/NTSC 28
GND 30
TO HEAD AMP SECTION 1D-3D
PIN702 (CN702)
1 A MUTE
2 EE
3 REG 9V
4 A IN
5 A GND
6 A OUT
7 A GND
TO A MAIN C.B (VIDEO SECTION) PIN402 (CN402)
P ERASE HEAD C.B
FEH
FULL ERASE HEAD
2 FE H 2
1 A GND 1
PIN5
CON702 (BT702)
FE
T741 BIAS OSC-70K
Q741 2SC2274F BIAS OSC
R743 10
R741 12K
C745 47/16
C742 0.047 M 100V
C743 1000P
C744 0.01
BH
BC
R731 100
C731 0.01
R732 33K
C733 1500P
R733 1.2K
C734 1/50
C735 33/16
R735 10K
R734 470
C732 470P
C736 0.01 (M)
R736 330K
R738 2.2K
C737 1/50
R726 3.3K
C721 470P
C722 22/25
R725 1M
R724 8.2K
AUDIO SIGNAL
:REC/PB AUDIO SIGNAL
:PB AUDIO SIGNAL
:REC AUDIO SIGNAL
:WAVEFORMS NO.
:CHECK RAND
VOLTAGE
( ):REC MODE
WITHOUT PARENTHESES
:PB OR REC MODE

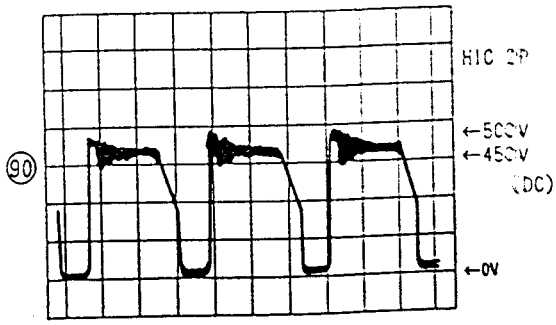

B FRONT C.B
D901 ~ D911
1SS133×1
S901 ~ S911
EVQ 21404M×11
D901 S901 POWER
D902 S902 EJECT
D903 S903 STOP
D904 S904 FF
D905 S905 REW
D906 S906 PLAY
D907 S907 PAUSE/STILL
D908 S908 RECORD
D909 S909 SYSTEM
D910 S910 TRACKING+
D911 S911 TRACKING-
KO0
KO1
KO2
KI3
KI2
KI1
KI0
5V
C901 10/16
CON901 (BT901)
1 SS 5V
2 REG 12V
3 KO 0
4 KO 1
5 KO 2
6 KI 3
7 KI 2
8 KI 1
9 KI 0
10 REMOCON
11 SS GND
TO A MAIN C.B (SERVO/SYS.CON.) SECTION PIN202 (CN202)
(SS 5V)
C902 0.01
IC901(BR901) SBX1610-52
Q901 DTC144ES
WAVEFORM SHAPING
(SS GND)
D919, D920 1SS133
IC901(BR901) REMOTE SENSOR
R902 220
Q902 ~ Q905 DTC114ES×4 SWITCHING
D913 ~ D916 SLZ381C×4
D919
D920
R905 47K
S912 AUTO TRACKING
OFF/MANUAL ON
D913 (GR) PAL
D914 (GR) MESECAM
D915 (GR) NTSC 3.58
D916 (GR) NTSC 4.43
D912 SLZ981C (RED) POWER
R901 1.2K
Q902
Q903
Q904
Q905
D917 AUTO TRACKING
D917 LT354TB
R903 220
D918 SLZ981C
R904 470
D918 RECORD
Q906 DTC114ES SWITCHING
Q907 DTC114ES SWITCHING
(SS GND)
CON902 (BT902)
1 AUTO/MAN
2 TR LED
3 REC
4 PAL
5 MESECAM
6 NTSC 3.58
7 NTSC 4.43
TO A MAIN C.B (SERVO/SYS.CON.) SECTION PIN203 (CN203)

Ref No.	DESCRIPTION
IC1	AN1431T TA or HA17431P or UPC1093J-T
IC2	AN78M05F A or UPC78M05HF
IC3	AN78M09F A or AN78L09F TA or UPC78M09HF or AN78M09F A
Q3	2SB733KB T
Q4	DTC114ES or AA1A4M T
D1	S1WBA60
D2	1SS270A-TD or 1SS202(1)-T1 or MA165
D3	HZ 6.2CF or HZ 6.2BP or RD 6.2FB
D4.5	S3LA20-04P15
D6	HZ 24BP-TK or HZ 24FB

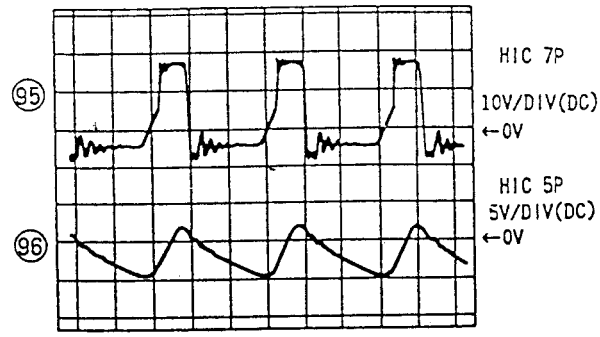
Q POWER C.B-1 R POWER C.B-2



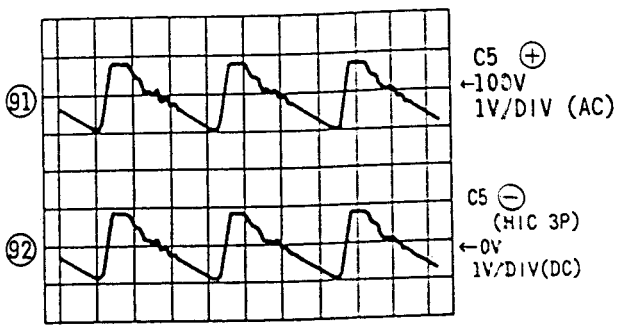
WAVE FORM – 5 (POWER SECTION)



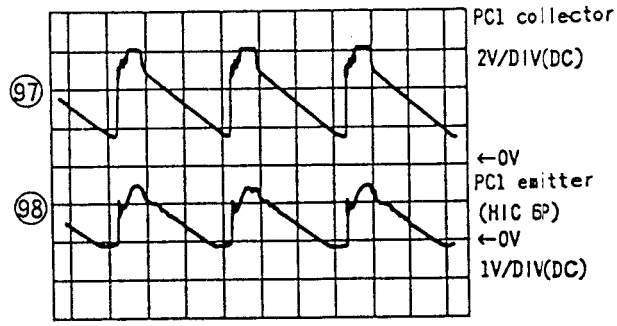
⑨⓪



⑨⑤ ⑨⑥

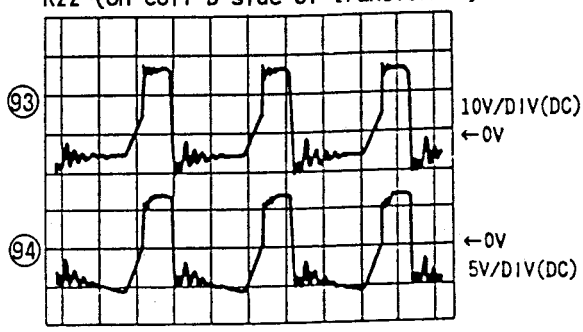


⑨① ⑨②



⑨⑦ ⑨⑧

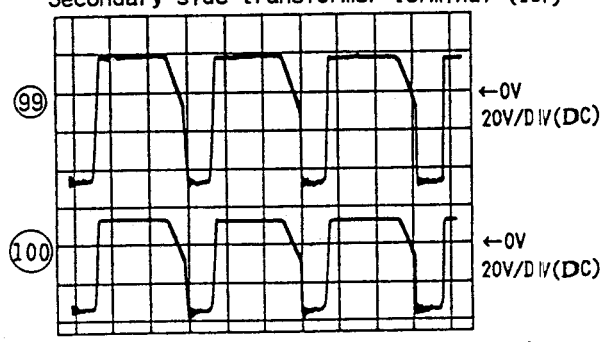
R22 (on coil B side of transformer)



⑨③ ⑨④

R4 (on R22 side)

Secondary-side transformer terminal (1SV)



⑨⑨ ①⓪⓪

Secondary-side transformer terminal (1NV)

※ · When checking wave forms ⑨⓪ - ⑨⑧ , connect the negative (-) terminal of C3 to ground (GND on primary side).
· When checking wave forms ⑨⑨ and ①⓪⓪ , connect pin 2 of CON101 to ground (GND on secondary side).
· Wave forms should be measured in the PB mode and with AC 220V power input.

IC DESCRIPTION – 2

IC,MB88515B

Description of Mechanism Microprocessor Pin Functions

<table>
<tr><th>Pin No.</th><th>Pin Name</th><th>I/O</th><th>Description</th><th>Active</th></tr>
<tr><td>1

2</td><td>TL-F

TL-R</td><td>O

O</td><td>Outputs to control the start/stop and direction of rotation of the tape sledding motor.
<table>
<tr><th>TL-F</th><th>TL-R</th><th>State</th></tr>
<tr><td>L</td><td>L</td><td>Stops</td></tr>
<tr><td>H</td><td>L</td><td>Rotates forward</td></tr>
<tr><td>L</td><td>H</td><td>Rotates in reverse</td></tr>
<tr><td>H</td><td>H</td><td>Braking to stop</td></tr>
</table></td><td>H

H</td></tr>
<tr><td>3

4</td><td>CM-F

CM-R</td><td>O

O</td><td>Outputs to control the start/stop and direction of rotation of the capstan motor.
<table>
<tr><th>CM-F</th><th>CM-R</th><th>State</th></tr>
<tr><td>L</td><td>L</td><td>Stops</td></tr>
<tr><td>H</td><td>L</td><td>Rotates forward</td></tr>
<tr><td>L</td><td>H</td><td>Rotates in reverse</td></tr>
<tr><td>H</td><td>H</td><td>Braking to stop</td></tr>
</table></td><td>H

H</td></tr>
<tr><td>5</td><td>A MUTE</td><td>O</td><td>Muting of audio signals.
Outputs “H” during trick play. When switching between the recorded signal and EE signal, this pin outputs “H” for the specified period before and after the inversion of the EE output to eliminate switching noise.</td><td>H</td></tr>
<tr><td>6</td><td>FLASH</td><td>O</td><td>Not used.</td><td>H</td></tr>
<tr><td>7</td><td>V MUTE</td><td>O</td><td>Muting of video signals.
Outputs “H” when the power is turned off and “L” when it is turned on. When the power is switched from OFF to ON, however, this pin outputs “H” for the specified period to switch and then outputs “L”.</td><td>H</td></tr>
<tr><td>8</td><td>$\overline{EE}$</td><td>O</td><td>Switches the video output between the external input signal and tape playback signal.
“H”: Tape playback signal
“L”: External input signal</td><td>L</td></tr>
<tr><td>9</td><td>$\overline{ACK}$</td><td>O</td><td>Serial communication reception complete signal from the tracking microprocessor.
Outputs “H” during serial communication and “L” when reception is completed. Continues to output “H” when reception is not completed due to an error in reception, etc.</td><td>L</td></tr>
<tr><td>10</td><td>P-ON</td><td>O</td><td>Outputs “H” during power on to control the power circuit of the VCR.</td><td>H</td></tr>
<tr><td>11</td><td>PAL/$\overline{NTSC}$</td><td>O</td><td>Output to switch between PAL and NTSC video signals.
“H”: PAL
“L”: NTSC</td><td>–</td></tr>
<tr><td>12</td><td>TRKG RST</td><td>O</td><td>Tracking microprocessor reset signal.
Outputs a pulse to reset the tracking microprocessor.</td><td>H</td></tr>
<tr><td>13</td><td>PLAY</td><td>O</td><td>Outputs “H” during the PLAY, STILL, CUE, REV and S-ADV modes.</td><td>H</td></tr>
<tr><td>14</td><td>D-PAUSE</td><td>O</td><td>Outputs “H” during the STILL and S-ADV modes.</td><td>H</td></tr>
<tr><td>15</td><td>REC</td><td>O</td><td>Outputs “H” in the REC mode.
Outputs a 500ms pulse in the REC PAUSE mode.</td><td>H</td></tr>
<tr><td>16</td><td>REPEAT</td><td>O</td><td>Outputs “H” in the REPEAT mode.</td><td>H</td></tr>
<tr><td>17</td><td>D-REC</td><td>O</td><td>When switched from STOP to REC and from REC PAUSE to REC, etc. and the tape is running, this pin outputs “H” after the capstan speed is stabilized to record on the tape.</td><td>H</td></tr>
<tr><td>18</td><td>JOG</td><td>O</td><td>Outputs “H” during the CUE and REV modes.</td><td>H</td></tr>
</table>

Pin No.	Pin Name	I/O	Description	Active
19	D-PLAY	O	When switched from STOP to PLAY and from STOP to STILL, etc. and the tape is running, this pin outputs "H" to prevent the pictures from being distorted.	H
20	VCR/$\overline{TV}$	–	Not used.	–
21	PAL	O	Outputs "H" in the PAL mode.	H
22	MESECAM	O	Outputs "H" in the MESECAM mode.	H
23	NTSC3.58	O	Outputs "H" in the NTSC 3.58 mode.	H
24	NTSC4.43	O	Outputs "H" in the NTSC 4.43 mode.	H
25	EX	I	Connected to a clock oscillator (6MHz) which generates a system clock pulse.	–
26	X	O		
27	$\overline{RST}$	I	System reset input.	L
28	SO	–	Not used.	–
29	SI	–	Not used.	–
30	$\overline{SCK}$	–	Not used.	–
31	REMOCON	I	Remote control data input.	L
32	VSS	–	Connected to Ground.	–
33	S. CLK	O	Outputs a timing pulse to the servo IC to transfer serial data.	–
34	S. DATA	O	Transfers serial data to the servo IC.	–
35	$\overline{REQ}$	–	Not used.	–
36	$\overline{READY}$	–	Not used.	–
37	KI0	I	Key matrix scan inputs.	L
38	KI1	I		L
39	KI2	I		L
40	KI3	I		L
41	$\overline{SYNC}$	I	Signal to synchronize serial communications with the timer microprocessor.	L
42	$\overline{VISS}$	I	Detects a VISS signal.	L
43	AVSS	–	Connected to Ground.	–
44	AVR–	–	Connected to Ground.	–
45	AVR+	–	Positive power terminal, connected to SS5V.	–
46	AVCC	–	Positive power terminal, connected to SS5V.	–
47	D-STILL	O	Outputs "H" during STILL and STILL-ADVANCE.	H
48	$\overline{LINE}$/TUN(A)	O	Switches the audio input. "H": Tuner audio "L": Line audio	–
49	KO5	O	Key matrix scan output signals.	–
50	KO4	O		
51	KO3	O		
52	KO2	O		
53	KO1	O		
54	KO0	O		
55	TOP S.	I	Receives a tape start detection signal. Inhibits switching to the reverse direction. When this signal is input during reverse running, it shifts the VCR to the stop mode.	H
56	END S.	I	Receives a tape end detection signal. Inhibits switching to the forward direction. When this signal is input during forward running, it shifts the VCR to the auto rewind mode.	H
57	RF SWP.	I	Receives drum rotation pulses. When the output of pulses is stopped for 2 seconds during an operation mode in which the drum rotates due to an anomaly in tape, mechanism, etc., the VCR is switched off automatically to protect the tape.	–

Pin No.	Pin Name	I/O	Description	Active
58	REEL S.	I	Receives a signal from the reel sensor in the mechanism. When the output of pulses is stopped for 2 seconds during an operation mode in which the reel rotates due to anomaly in tape, mechanism, etc., the VCR is switched off automatically to protect the tape.	–
59	(PULL UP)	–	Not used.	–
60	$\overline{\text{C·START}}$	I	Connected to a cassette start switch in the cassette loading mechanism to perform the cassette-in operation (loading). When this signal is detected during eject, the capstan motor is switched to be pulse driven.	L
61	$\overline{\text{C-IN}}$	I	Connected to a cassette-in switch in the cassette loading mechanism to detect the cassette-in status.	L
62	$\overline{\text{C-OUT}}$	I	Connected to a cassette-out switch in the cassette loading mechanism to detect the cassette-out (eject) status. Instructs to stop the cassette-out operation (unloading).	L
63	NC	–	Not used.	–
64	VCC	–	Positive power terminal, connected to SS5V.	–

IC,HD49754

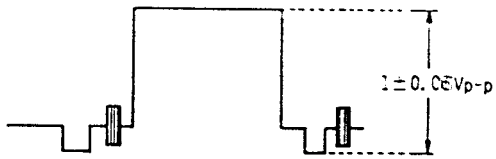
Pin No.	Pin Name	I/O	Description
1	——	–	——
2	MODE OUTPUT C	O	Speed mode outputs.
3	MODE OUTPUT B	O	
4	MODE OUTPUT A	O	
5	CTL MM	–	Delay time constant for X-value correction. (correcting the position of control pulse)
6	PG MM	–	Switching position monostable multivibrator. Delay time constant for head switching point adjustment.
7	DRUM PG	I	Drum PG input.
8	GND	–	Connected to Ground.
9	DRUM FG	I	Drum FG input.
10	DRUM SELECT A	I	Fixed at "H".
11	DRUM SELECT B	I	
12 13 15 16 18	DRUM MIX AMP	–	Drum servo phase/speed error mixing amp.
21 23 24 25 26 27	CAP MIX AMP	–	Capstan servo phase/speed error mixing amp.
14	DRUM FV OUT	O	Drum servo speed error output. (D/A output)

Pin No.	Pin Name	I/O	Description
17	DRUM PD OUT	O	Drum servo phase error output. (D/A output)
19	NTSC/PAL	I	NTSC/PAL switching signal input. ("H" in NTSC)
20	CAP PD OUT	O	Capstan servo phase error output. (D/A output)
22	CAP FV OUT	O	Capstan servo speed error output. (D/A output)
28	VCC	–	Power supply. (+5V)
29	CTL HEAD –	–	Input/output pin for the control head.
30	CTL HEAD +	–	
31	GND	–	Connected to Ground.
32~35	CTLP AMP	–	CTL amp.
36	CTLP IN	I	Playback CTL pulse input.
37	C FG	I	Capstan FG input.
38	VCC	–	Power supply. (+5V)
39	CTL CLK	O	Shapes the playback CTL pulse and outputs it.
40	DUTY I/O	O	VISS detection output. ("L" when detected)
41	——	–	Fixed at "L".
42	3fsc IN	I	Reference clock input. NTSC: 10.738635MHz, PAL: 13.300856MHz
43	3fsc OUT	O	Reference clock output. NTSC: 10.738635MHz, PAL: 13.300856MHz
44	——	–	——
45	V FF	O	Video head switching signal output.
46	A FF	O	Audio head switching signal output.
47	E FF	O	Erase head switching signal output.
48	VP	O	Artificial VD pulse output.
49	——	–	——
50	CMP SYNC	I	Composite sync signal input.
51	EXT. RESET	I	Fixed at "H".
52	P. ON RESET	I	Resets the IC when the power is turned on so that current is not supplied to the CTL HEAD pins.
53	S. DATA	I	Servo control serial data input. (16 bits)
54	S. CLK	I	S. DATA transferring clock input.
55	CFG C/D	O	Counts down the capstan FG pulses by the speed multiple in search and outputs them.
56	CTL C/D	O	Counts down the CTL pulses by the speed multiple in search and outputs them.

ELECTRICAL ADJUSTMENT

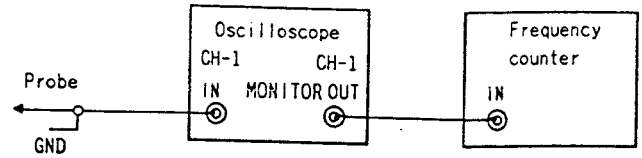
Preparation for adjustment

Input signal (100% white)

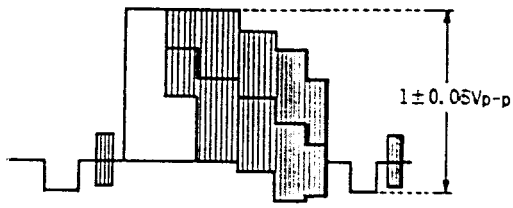


※Note : Voltage measured with a signal generator connected to the VCR

Connection of test equipment

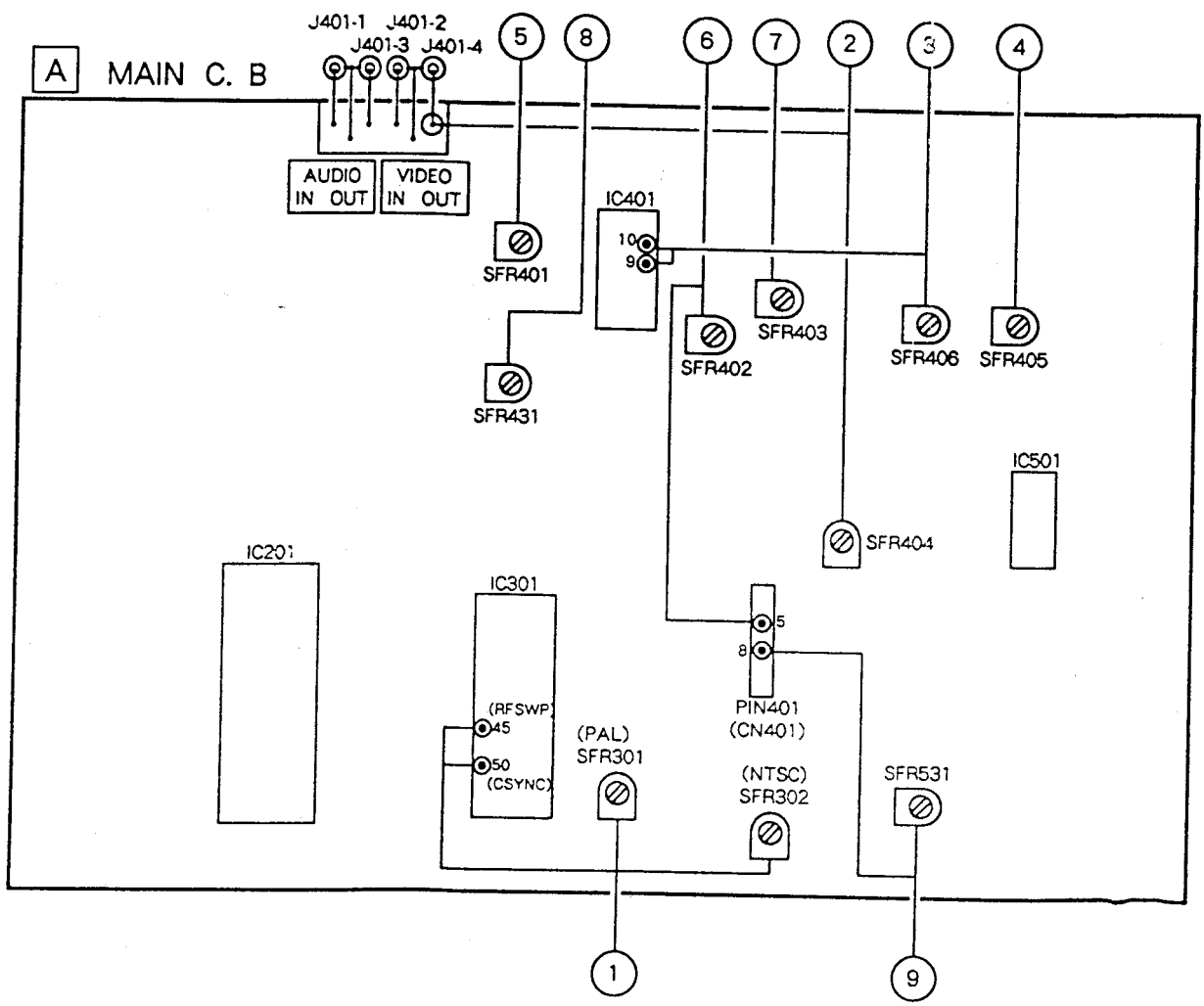


Input signal (color bars)



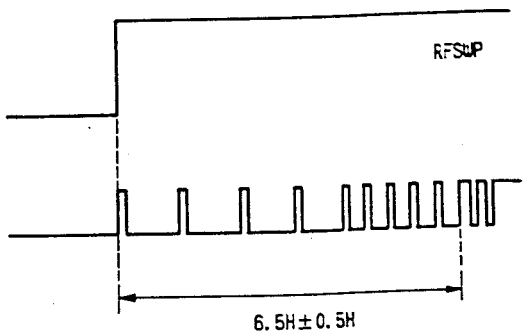
※Note : Voltage measured with a signal generator connected to the VCR

ADJUSTMENT



Servo circuit adjustment

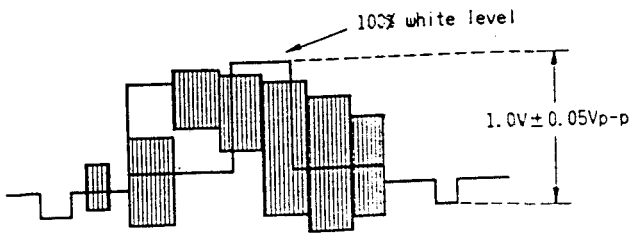
1. Switching Point Adjustment
   Oscilloscope CH-1 : IC301 pin (45) (RF SW)
   CH-2 : IC301 pin (50) (C SYNC)
   1) Set the AUTO TRACKING switch to OFF and set the manual tracking to the center.
   * Load or unload a cassette or change over the SYSTEM switch to reset the tracking to the center.
   2) Set the SYSTEM switch.
   PAL : Set to PAL
   NTSC : Set to NTSC.
   3) Playback alignment tape.
   PAL : TTV-P1
   NTSC : TTV-N1
   4) Adjust to the following specification.
   PAL : SFR301
   NTSC : SFR302



* Be sure to adjust PAL first.

Video circuit adjustment

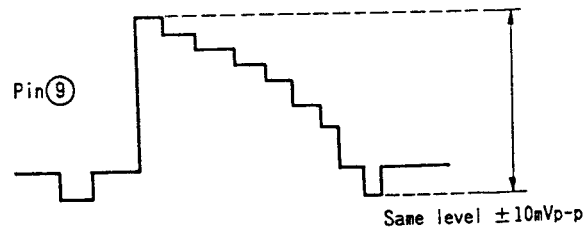
2. Playback Y Level Adjustment
   Oscilloscope : VIDEO OUT
   1) Set the SYSTEM switch to PAL.
   2) Play back TTV-P1 and adjust SFR404 so that the waveform is as shown in the figure below.

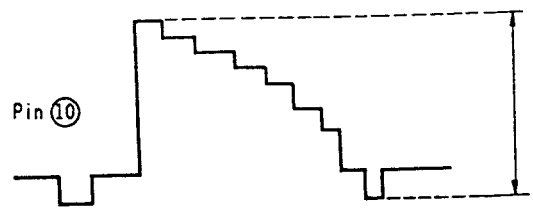


* Connect a monitor LINE OUT or terminate LINE OUT with 75 ohm.

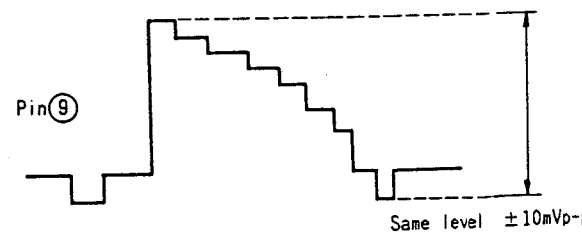
   3) Set the SYSTEM switch to NTSC.
   4) Play back TTV-N1 and check that the level is within the specification.
   Specification : The 100% white level is 1.0V±0.05Vp-p.

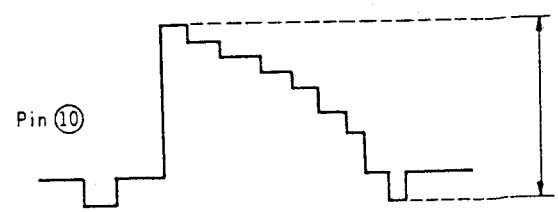
3. DOC Level (NTSC) Adjustment
   Oscilloscope CH-1 : IC401 pin (9)
   CH-2 : IC401 pin (10)
   1) Play back TTV-N1 and adjust SFR406 so that both signal levels are same.



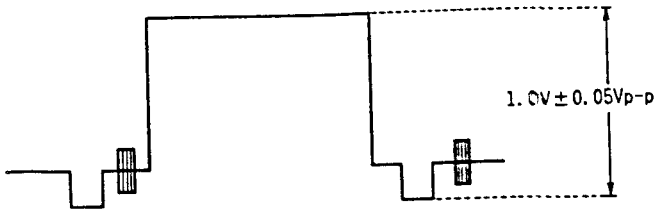


4. DOC Level (PAL) Adjustment
   Oscilloscope CH-1 : IC401 pin (9)
   CH-2 : IC401 pin (10)
   1) Play back TTV-P1 and adjust SFR405 so that both signal levels are the same.

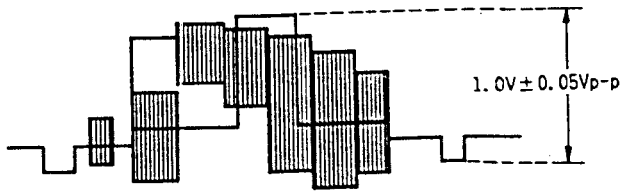




5. AGC Adjustment
   Oscilloscope : VIDEO OUT
   1) Apply a PAL color bar signal (with 100% white) to LINE IN.
   2) Adjust SFR401 so that the specification in the figure below is satisfied in the E-E mode.

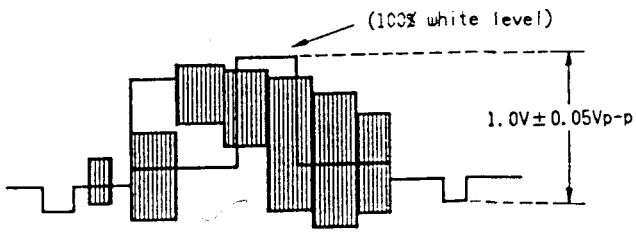


   * Connect a monitor to LINE OUT or terminate LINE OUT with 75 ohm.
   3) Apply an NTSC color bar signal (with 100% white) to LINE IN.
   4) Check that the specification shown in the figure below is satisfied in the E-E mode.



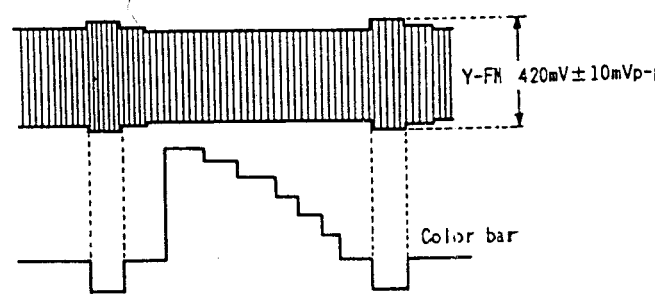
6. Y-FM Carrier Adjustment
   Oscilloscope : CN401 pin⑤
   1) Set LINE IN to the no signal input state (no equipment is connected). Set the SYSTEM switch to NTSC.
   2) Adjust SFR402 so that the reading of the frequency counter is within the specification in the E-E mode.
      Specification : 3.4MHz±0.05MHz
   3) Set the SYSTEM switch to PAL.
   4) Check that the frequency is within the specification in the E-E mode.
      Specification : 3.8MHz±0.05MHz

7. Y-FM Deviation Adjustment
   Oscilloscope : VIDEO OUT
   1) Apply an NTSC color bar signal (with 100% white) to LINE IN and record it. Set the SYSTEM switch to NTSC.
   2) Play back the recorded section and check that the level is within the specification as shown below.

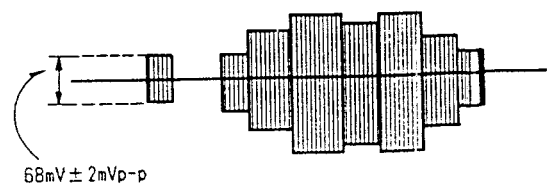


   3) If the level is out of the specification, adjust SFR403.
   4) Repeat steps 1) and 2) so that the level is within the specification.
   5) Apply a PAL color bar signal (with 100% white) to LINE IN and record it. Set the SYSTEM switch to PAL.
   6) Play back the recorded section and check that the level is within the specification.
   * Connect a monitor to LINE OUT or terminate LINE OUT with 75 ohm.
   * The Y-FM carrier should have already been adjusted before this adjustment.

8. REC Y Level Adjustment
   Oscilloscope : CN401 pin⑤
   1) Apply a PAL color bar signal to LINE IN.
   2) Set the SYSTEM switch to NTSC.
   3) Adjust SFR431 so that the sync tip level is as shown in the figure in the E-E mode.



9. REC C Level Adjustment
   Oscilloscope : CN401 pin⑧
   1) Apply a PAL color bar signal to LINE IN.
   2) Adjust SFR531 so that the color burst level is as shown in the figure in the E-E mode.



SERVICE MODE

1. Start of service mode
   1)After turning the power on, short-circuit pins ⑧ and ⑨ of BT901 on the front circuit board.
   2)Each time the pins are short-circuited, the service mode switches between 1 and 2.
   3)The service mode 1 or 2 can be discriminated as follows.
   Service mode 1 ··· SYSTEM LEDs go out
   Service mode 2 ··· SYSTEM LEDs light

2. Service mode 1
   An error in the mechanism is indicated by the SYSTEM indication LEDs. (See Table 1)

LED / Error	PAL	MESECAM	NTSC3.58	NTSC4.43
Loading	1	0	0	0
Unloading	0	1	0	0
Sledding	1	1	0	0
Unsledding	0	0	1	0
Mechanism initialized	1	0	1	0
Leader tape processed	0	1	1	0
Drum (RF SWP)	1	1	1	0
Reel (REEL S)	0	0	0	1
Mechanism position	1	0	0	1
Normal	0	0	0	0

Table 1

3. Service mode 2
   The following sensor inputs are disabled in service mode 2.
   MAIN C.B IC201 (MB88515B)
   Pin ⑮ TOP SENSOR
   Pin ⑯ END SENSOR
   Pin ⑰ RF SWP
   Pin ⑱ REEL SENSOR

PRACTICAL SERVICE FIGURE

Output level

Video (Impedance) : 1.0 ± 0.2Vp – p (75 Ω ± 20 %, Unbalance)

Audio (Impedance) : – 8 ± 3dB (Less than 2.2k Ω)

RF Modulated (Impedance) : 75 ± 3dB μ V (75 Ω, Unbalance)

SH 30CH~39CH (G,K)

Input Level

Video (Impedance) : 1.0 ± 0.5Vp – p (75 Ω ± 20 %, Unbalance)

Audio (Impedance) : – 10 ± 3dBs (More than 47k Ω)

S/N Ratio

Video (SP mode) : More than 42dB (PB) (Y – Signal)
More than 40dB (R/P) (Y – Signal)
More than 38dB (PB) (C – Signal,AM)
More than 38dB (R/P) (C – Signal,AM)
More than 36dB (PB) (C – Signal,PM)
More than 36dB (R/P) (C – Signal,PM)
Audio (SP mode)

Audio (SP mode) : More than 40dB (R/P)

Audio Distortion : Less than 3 % (R/P)

Audio Frequency Response (SP mode) : 200Hz~6kHz ± 4dB

Horizontal Resolution : More than 230 lines (PAL, MESECAM, R/P)
More than 220 lines (NTSC, PB, R/P)

Erase Ratio : More than 55dB

Bias Frequency : 70kHz ± 10 %

Tape Speed (SP mode) : 23.39mm/sec ±0.5 % (PAL/MESECAM)
33.35mm/sec ±0.5 % (NTSC)

Wow & Flutter : Less than 0.5 % (R/P,DIN UNWTD)

F.F time : Less than 300sec (T – 120)

REW time : Less than 300sec (T – 120)

Back tension : 46.5 ± 12g – cm

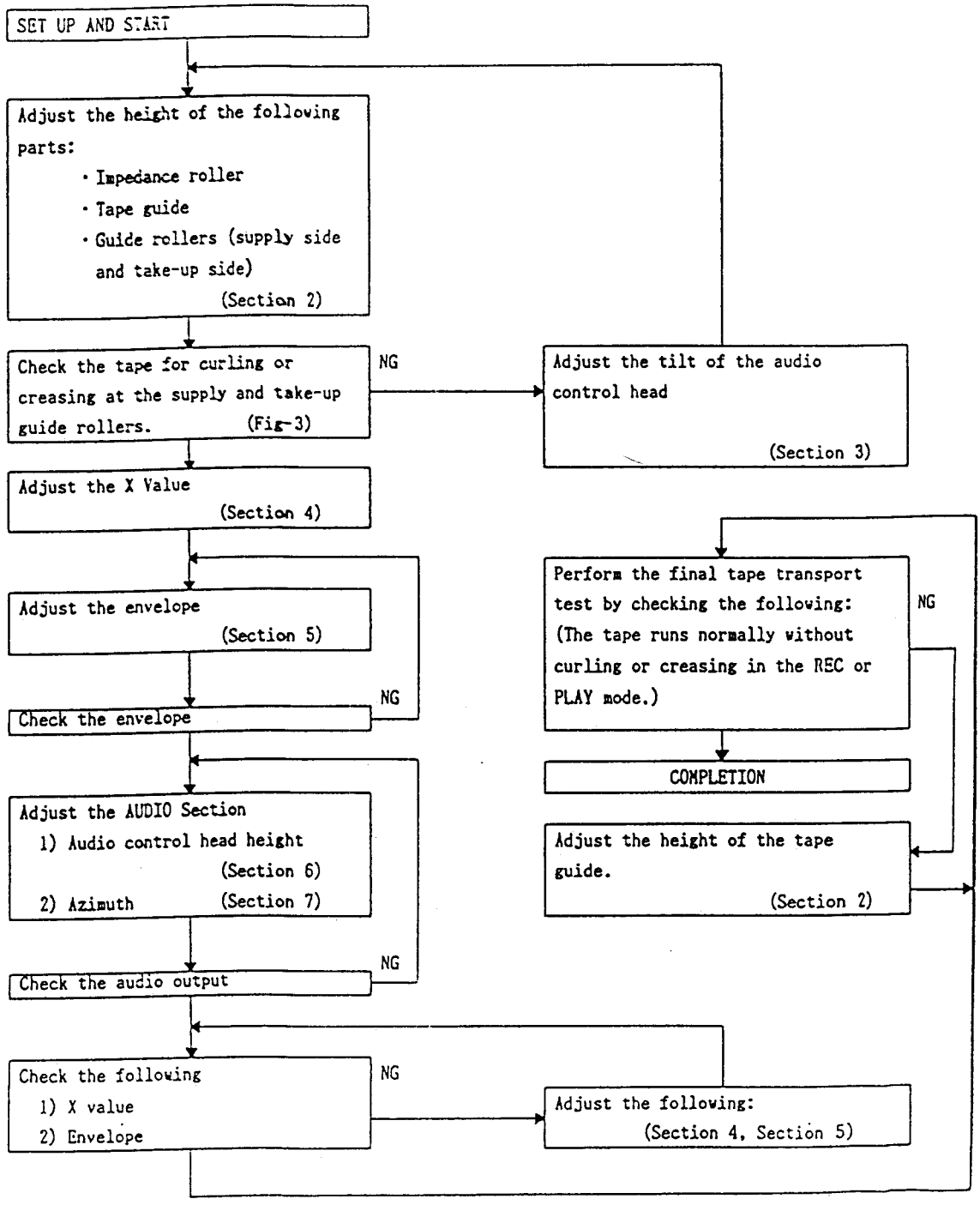
Loading time : Less than 3sec

Unloading time : Less than 3.5sec

Test Tape : MVP – 08 (PB)
MVP – 09 (PB)
TPV – 160S
TTV – 06T
TTV – P5
HS – T120

MECHANICAL ADJUSTMENT

1. TAPE TRANSPORT ADJUSTMENT FLOWCHART


SET UP AND START
Adjust the height of the following parts:
• Impedance roller
• Tape guide
• Guide rollers (supply side and take-up side)
(Section 2)
Check the tape for curling or creasing at the supply and take-up guide rollers. (Fig-3)
NG
Adjust the tilt of the audio control head
(Section 3)
Adjust the X Value
(Section 4)
Adjust the envelope
(Section 5)
Check the envelope
NG
Adjust the AUDIO Section
1) Audio control head height
(Section 6)
2) Azimuth
(Section 7)
Check the audio output
NG
Check the following
1) X value
2) Envelope
NG
Adjust the following:
(Section 4, Section 5)
Perform the final tape transport test by checking the following:
(The tape runs normally without curling or creasing in the REC or PLAY mode.)
NG
COMPLETION
Adjust the height of the tape guide.
(Section 2)

2. TAPE RUNNING POSITION ADJUSTMENT

(GUIDE ROLLER/TAPE GUIDE/IMPEDANCE ROLLER)

Set-up

Use the J-8 and lift the "main circuit board". (See the SERVICE JIG AND TOOLS)

1. Perform the height adjustment for the following items to obtain the proper tape running position. (See Figure-1)
   - ① Impedance roller
   - ② Guide roller (Supply side)
   - ③ Guide roller (Take-up side)
   - ④ Tape guide

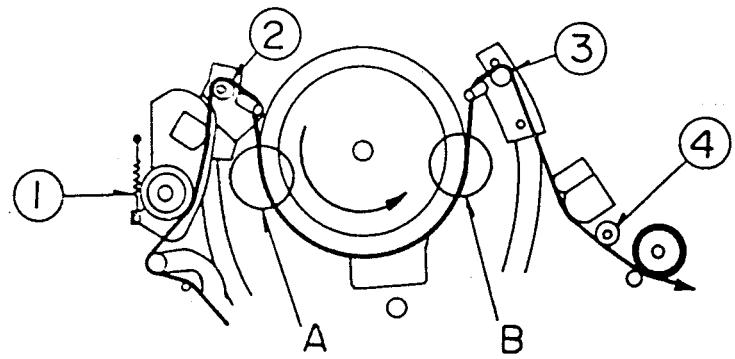


Fig.—1

2. Load a blank tape and set the VCP to the PLAY mode. Check the tape transport at points "A" and "B" as shown in Fig-1.

3. Operate the VCP between the PLAY and STOP modes several times.

4. Observe the tape transport at the "Lead surface of the cylinder" during the PLAY mode, and confirm that the tape runs smoothly along the "Lead surface of the cylinder" without slipping downward or upward. (See Figure-2)

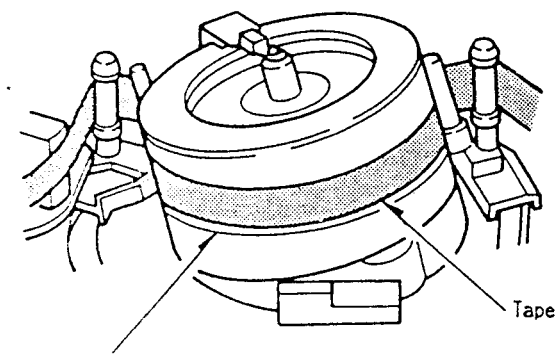


Fig-2

5. During loading, play and unloading, observe the tape at the supply and take up "Guide rollers", "Tape guide" and "Impedance roller". Confirm that there is no curling or creasing etc., as shown in Fig-3.

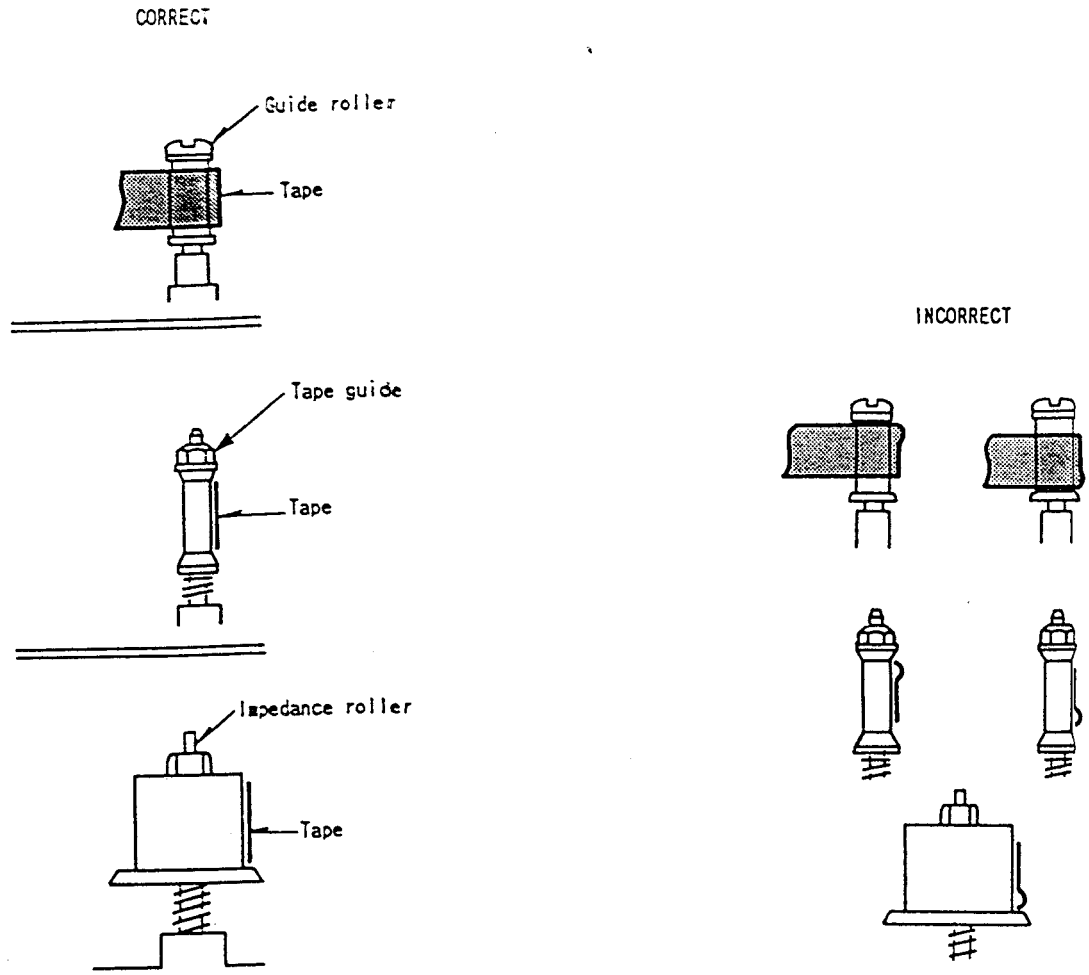


Fig-3

6. If any curling or creasing is noted, adjust "Tape guide roller" and "Impedance roller" first. In this case, adjust the "Impedance roller" in both PLAY and REV modes so that the tape runs as shown in Fig-4.

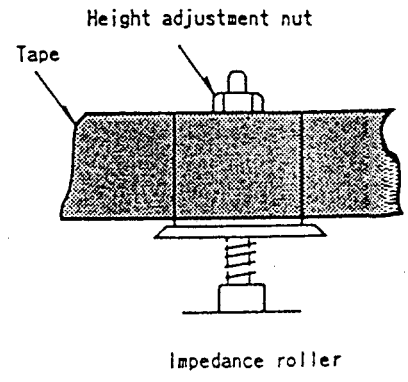


Fig-4

7. Next, adjust the "Guide roller" height. Insert the adjustment driver (J2) into the "Guide roller" top. (See Figure-5)
Adjust the height by turning the driver slightly so that the tape runs on the "Guide roller" as shown in Fig-3, and the lower edge of the tape runs along the "Lead surface of the cylinder".

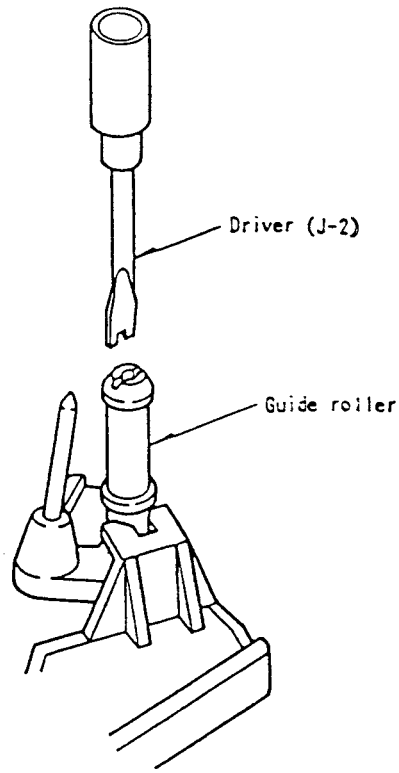
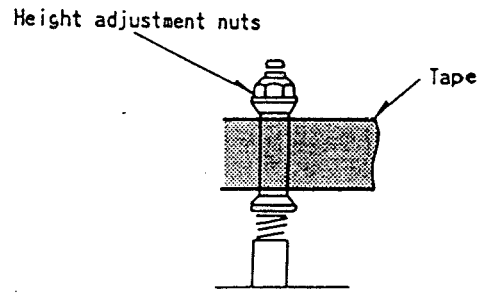


Fig-5



Tape Guide

Fig-6

8. After completion of the supply side "Guide roller" adjustments, adjust "Tape guide" so that tape runs as shown in Fig-6 and adjust the take-up side "Guide roller" by using the same procedures as for the supply side adjustments.
In this case, adjust the "Guide roller" height first.

9. Confirm that there is no curling or creasing at the "Impedance roller" (Both PLAY and REV modes). If there is any curling or creasing at the "Impedance roller", adjust the same procedures of Fig-6.

10. Finally, confirm that there is no curling or creasing at the take-up side guide roller and tape guide. If there is any curling or creasing between the take-up side "Guide roller" and the "ACE head", adjust the "ACE head".

3. AUDIO CONTROL HEAD ADJUSTMENT

1. Load a recorded tape and set the it to PLAY mode.

2. Adjust the height of the edge of the "Audio track" on the "Audio control head" by using the height adjustment nut (A) and the "Tilt adjustment screw" (C) so that the tape transport is smooth at the "Take-up guide pole". Align the "Audio control head" height. (See Figure-7)

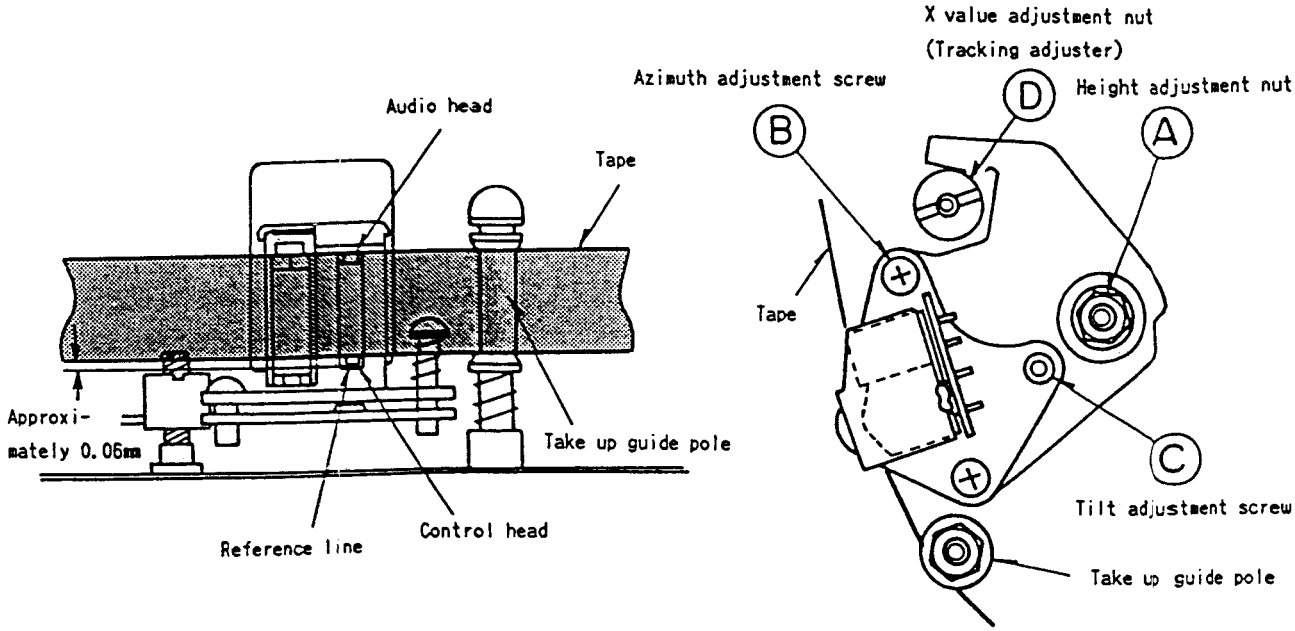


Fig-7

3. The fine adjustment is not required at this time.
   The following conditions are sufficient :
   (a) Proper tape transport between the "Audio control head" and the "Take-up guide pole".
   (b) Stable SERVO system operation (proper pickup of tape's recorded control signal).

4. X VALUE ADJUSTMENT (PB FM PEAK ADJUSTMENT)

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
MAIN C.B CN401 3 pin (Y PB FM) MAIN C.B CN401 9 pin (RF SWP)	Oscilloscope	PLAY (SP) MODE Test tape TTV-P2

ADJ. Location	ADJ. Value
X value adjustment nut	Maximum level (CH1 Y PB FM Signal)

TEST EQUIPMENT CONNECTING DIAGRAMS

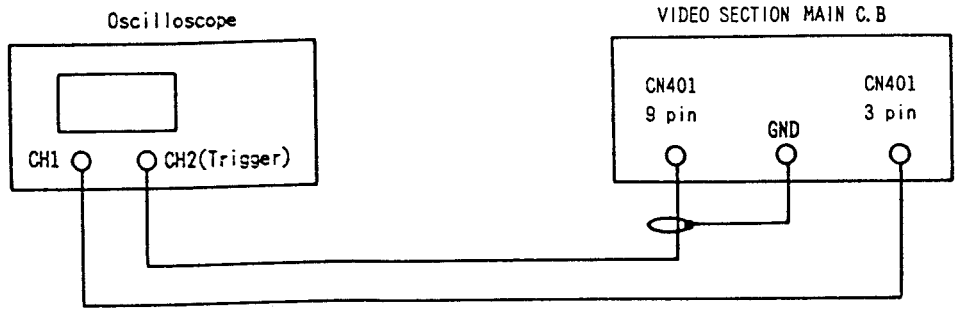


Fig-8

1. Connect the equipment as shown in Fig-8.

2. Set the auto tracking switch to off and the manual tracking to the center.
* The maual tracking is set to the center when a cassette is loaded or ejected or the SYSTEM switch is changed over.

3. Adjust the "X value adjustment out Ⓓ" for maximum PB FM signal for CH1 by using TTV-P2 test tape. (See Figure-9)

4. After adjusting the "X value", check that the output level of the PB FM signal for CH1 changes symmetrically by Tracking switch.

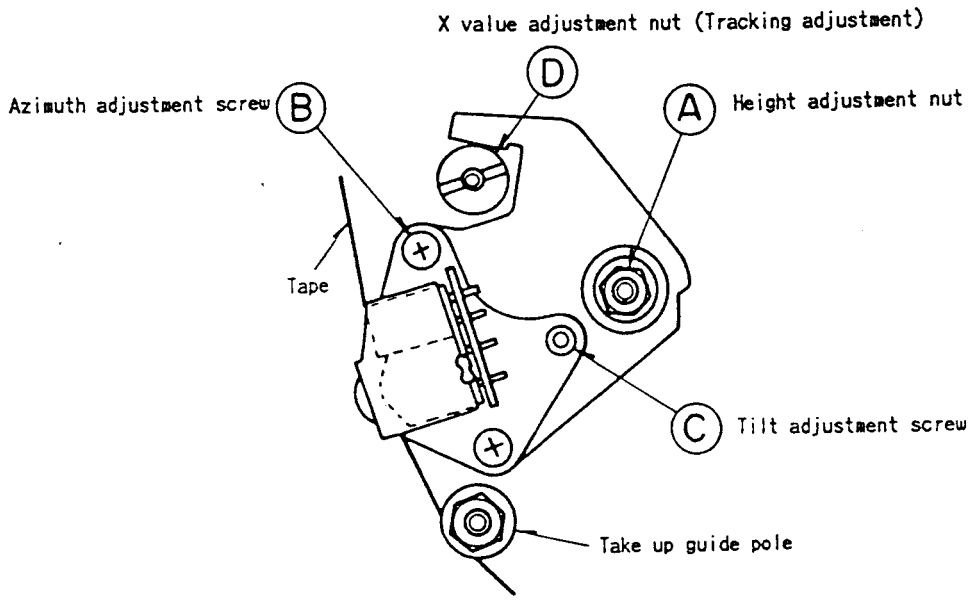


Fig-9

5. ENVELOPE WAVE FORM ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
MAIN C.B CN401 3 pin (Y PB FM) MAIN C.B CN401 9 pin (RF SWP)	Oscilloscope	PLAY (SP) MODE Test tape TTV-P2

ADJ. Location	ADJ. Value
Guide rollers	Maximum level and correct waveform (PB Y FM Signal)

TEST EQUIPMENT CONNECTING DIAGRAMS

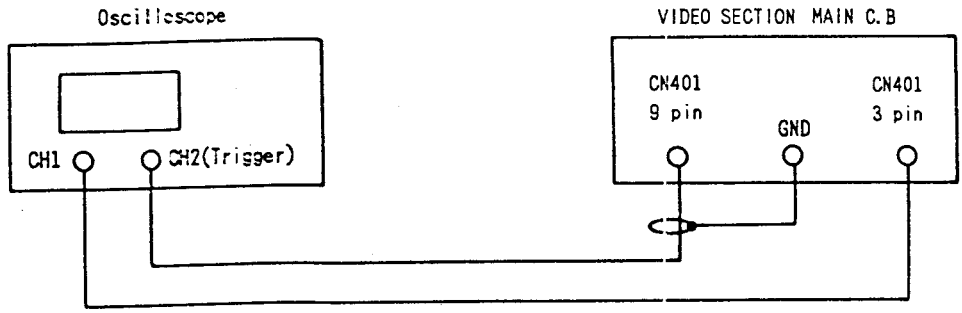


Fig.-10

1. Connect equipment as shown in Fig-10.

2. Playback the test tape TTV-P2.

3. The envelope waveform can be performed by adjusting the height of both the supply side and take-up side "Guide rollers".
   Finaly adjust the height of "Guide rollers" so that the envelope waveform is as flat as possible.

4. Manual tracking to its center position and confirm that a nearly maximum level is obtained.
   Then push the Tracking SW in both directions while adjusting the height of "Guide rollers", in order to obtain the envelope waveform which is as flat as possible.
   If the tape is above or lower the helical tape position, the envelope waveforms will take the shape as shown in Fig-11 and Fig-12.

5. Adjust for maximum flatness of the envelope waveform according to the Fig-11 and Fig-12.

6. After adjustment, variable in the + or - tracking, and check that the waveform changes symmetrically.

7. Check the tape curl. (Refer to Section 2)

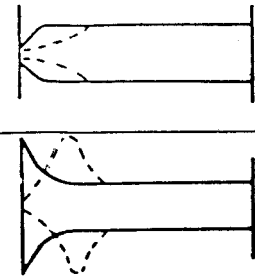
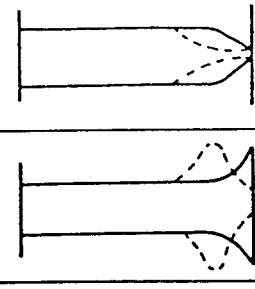
	Tape is too high	
	Supply side	Take-up side
when the tracking volume is variable in the + and - directions		
Adjustment	Supply side "Guide roller" variable in the + direction (lowers "Guide roller") to flatten evnelope.	Take-up side "Guide roller" variable in the + direction (lowers "Guide roller") to flatten envelope.

Fig-11

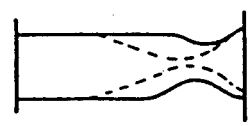
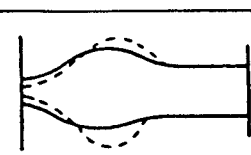
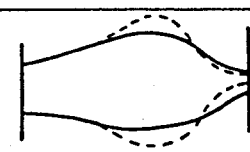
	Tape is too low	
	Supply side	Take-up side
when the tracking volume is variable in the + and - directions		
		
Adjustment	Supply side "Guide roller" variable in the - direction (raises "Guide roller") to flatten evnelope.	Take-up side "Guide roller" variable in the - direction (raises "Guide roller") to flatten envelope.

Fig-12

6. AUDIO CONTROL HEAD HEIGHT/AUDIO CONTROL HEAD TILT ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
AUDIO OUTPUT	Oscilloscope AC voltmeter	PLAY (SP) MODE Test tape TTV-P1

ADJ. Location	ADJ. Value
Height adjustment nut Azimuth adjustment screw	Maximum level (AC voltmeter)
Tilt adjustment screw	

TEST EQUIPMENT CONNECTING DIAGRAMS

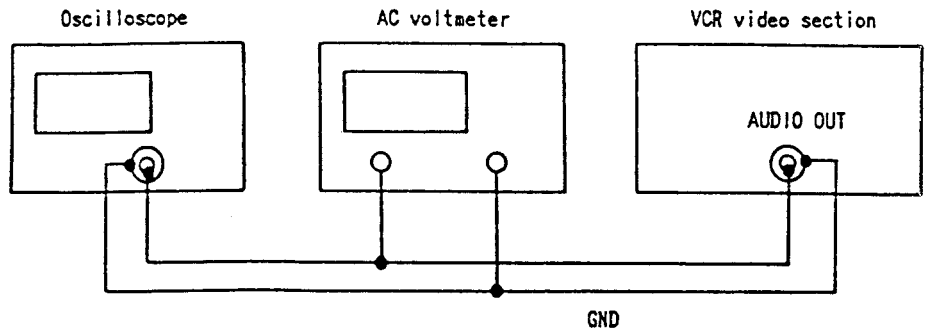


Fig-13

1. Connect equipment as shown in Fig-13.

2. Confirm that the running between the "Take-up guide roller" and the "ACE head" has no slack. If the tape has slack, take it up by turning the "Tilt adjustment screw Ⓒ". (See Figure-15)
   Then readjust "Guide roller " height in section 2 and the "X value" in section 4.

3. After confirming on the oscilloscope that a 1kHz audio signal is being output by playing back TTV-P1 test tape, adjust the "Height adjustment nut Ⓐ" so that the AC voltmeter's reading is brought to its maximum level.
   (See Figure-7)

4. Adjust the "Azimuth adjustment screw Ⓑ" so that the AC voltmeter's reading is brought to its maximum level.
   (See Figure-7)

7. AUDIO CONTROL HEAD AZIMUTH ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
AUDIO OUTPUT	Oscilloscope AC voltmeter	PLAY (SP) MODE Test tape TTV-P2

ADJ. Location	ADJ. Value
Azimuth adjustment nut	Maximum level (AC voltmeter)

TEST EQUIPMENT CONNECTING DIAGRAMS

See Figure-13.

Fig-14

1. After confirming on the oscilloscope that a 6kHz audio signal is being output by playing back TTV-P2 test tape, adjust the "Azimuth adjustment screw Ⓑ" so that the AC voltmeter's reading or oscilloscope waveform is brought to its maximum lebel. (See Figure-15)

Note : Fix the screw Ⓑ and Ⓒ with lock paint after readjustment.

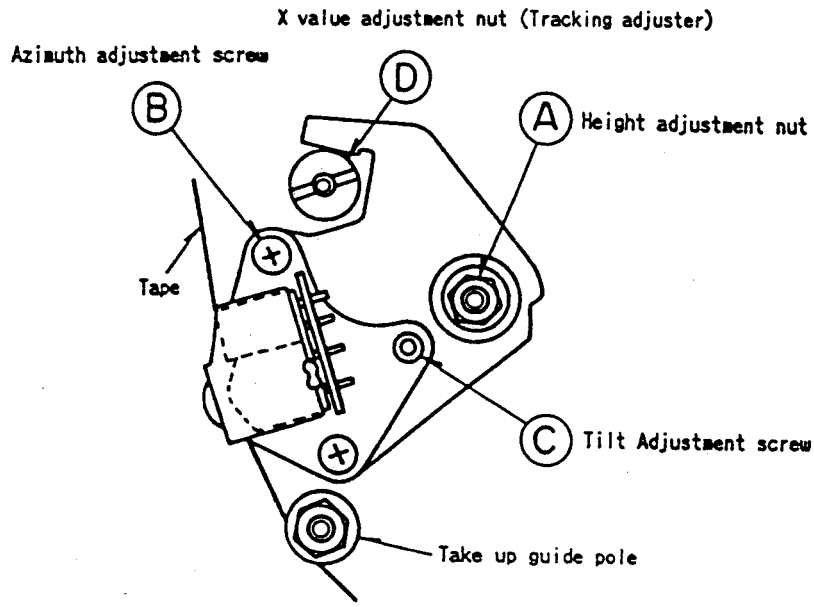
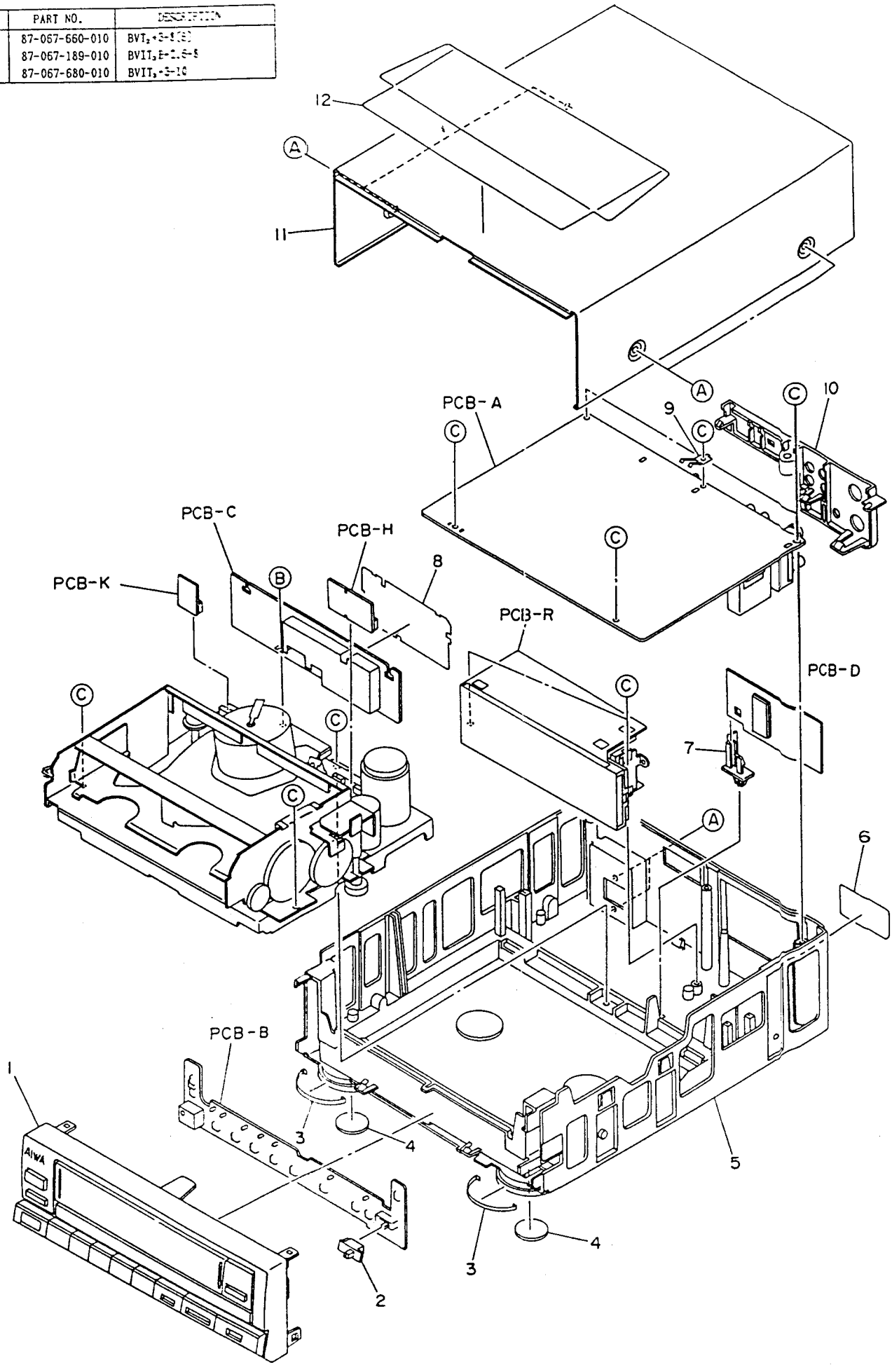


Fig-15

EXPLODED VIEW – 1

REF.NO.	PART NO.	DESCRIPTION
A	87-067-660-010	BVT₂+3-8 (S)
B	87-067-189-010	BVII₃E-2.6-S
C	87-067-680-010	BVII₃+3-10

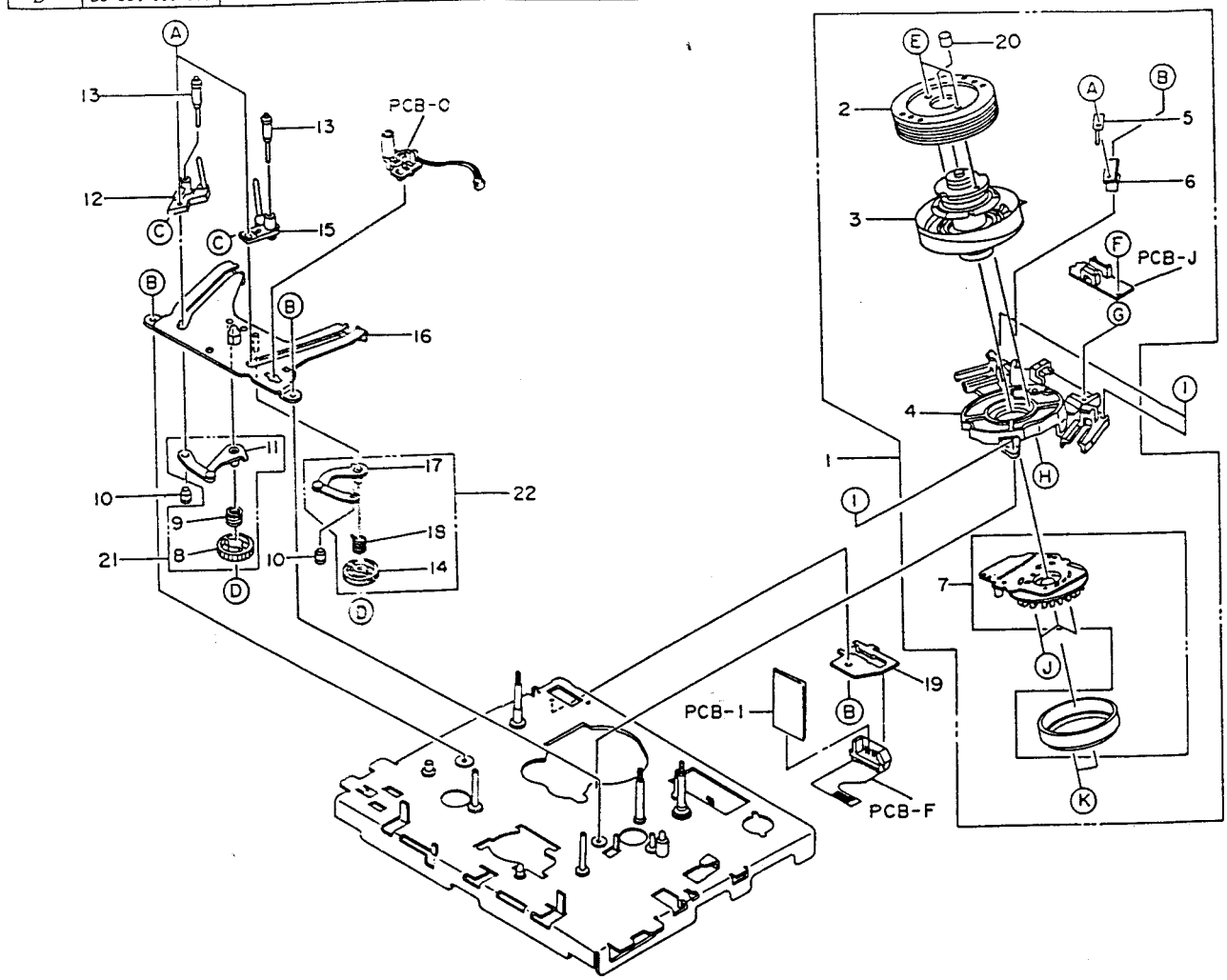


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	1-1	*09-057-076-010	CABINET,FRONT		1
	1-2	*80-JU8-008-010	KNOB,SLIDE	*	1
	1-3	*89-JU7-018-010	PLATE,FOOT		2
	1-4	*89-JU7-014-010	FOOT		2
	1-5	*89-JU7-002-010	CABINET,MAIN		1
	1-6	---	PLATE,SPEC		1
	1-7	---	HOLDER,PCB		1
	1-8	---	SHIELD,RP2		1
	1-9	80-JU8-209-010	PLATE,EARTH 2	*	1
	1-10	*89-JU8-022-010	PLATE,REAR DK		1
	1-11	*89-JU7-015-010	CABINET,STEEL		1
	1-12	---	SHEET,POP		1

EXPLODED VIEW – 2

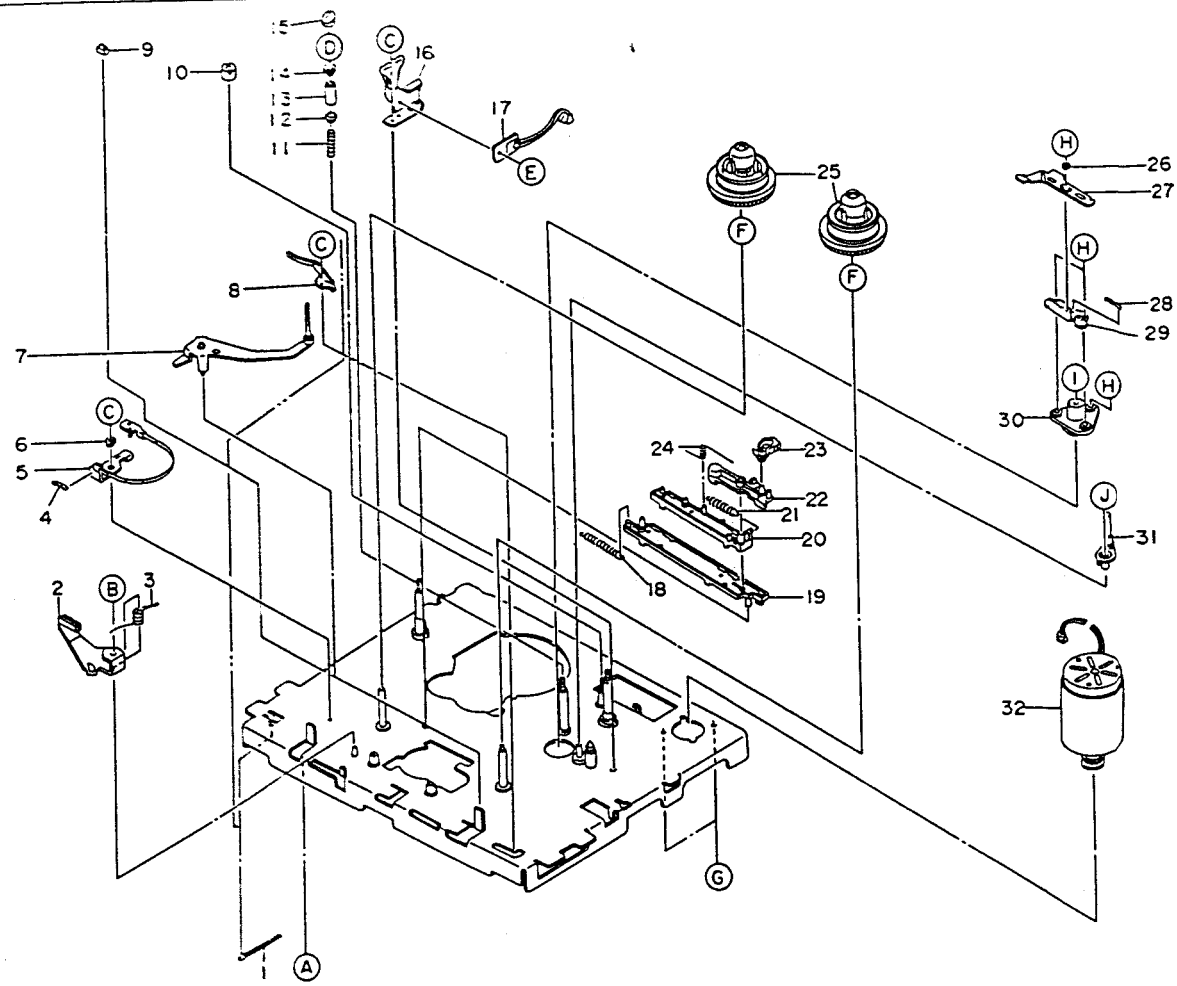
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-665-000-000	CUP SCREW 2.6×3	E	S9-972-000-000	BIND TAMS SCREW 3×8	I	S9-205-000-000	C TAPPING SCREW 3×10
B	S9-192-000-000	C TAPPING SCREW 2.6×5	F	S9-973-000-000	W TAMS SCREW 2.6×6	J	S9-055-000-000	SCREW 2.6×2.0
C	S9-550-000-000	SET SCREW 2.0×3 (FLANE)	G	S9-715-000-000	WASHER 2.6	K	S9-999-200-350	TAMS SCREW 2.6×6
D	S9-884-000-000	PW CUT 2.6×6×1.5	H	S9-999-180-180	SCREW(FOR CAMERA) 2×5			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	2-1	★S8-059-725-0A0	CYLINDER ASSY		1
	2-2	S8-059-010-190	UPPER DRUM		1
	2-3	★S8-059-013-040	LOWER DRUM ASSY		1
	2-4	★S8-059-010-010	CYLINDER MOUNT		1
	2-5	★S8-059-010-540	DRUM EARTH		1
	2-6	★S8-059-010-020	DRUM EARTH BRACKET		1
	2-7	S6-004-030-240	MOTOR TM82		1
	2-8	★S8-059-030-060	T LOADING GEAR L		1
	2-9	★S8-059-030-080	LOADING GEAR SPRING L		1
	2-10	★S8-059-030-140	LOADING BOSS		2
	2-11	★S8-059-035-020	LOADING PLATE L SEMI ASSY		1
	2-12	★S8-059-030-040	LOADING BLOCK L		1
	2-13	★S8-000-030-370	ROLLER POST ST		2
	2-14	★S8-059-030-070	T LOADING GEAR R		1
	2-15	★S8-059-030-050	LOADING BLOCK R		1
	2-16	★S8-059-035-010	LOADING BASE SEMI ASSY		1
	2-17	★S8-059-035-030	LOADING PLATE R SEMI ASSY		1
	2-18	★S8-059-030-090	LOADING GEAR SPRING R		1
	2-19	---	CONNECTOR BRACKET		1
	2-20	★S8-059-010-260	DRUM EARTH		1
	2-21	★S8-059-033-020	LOADING GEAR L ASSY		1
	2-22	★S8-059-033-030	LOADING GEAR R ASSY		1

EXPLODED VIEW – 3

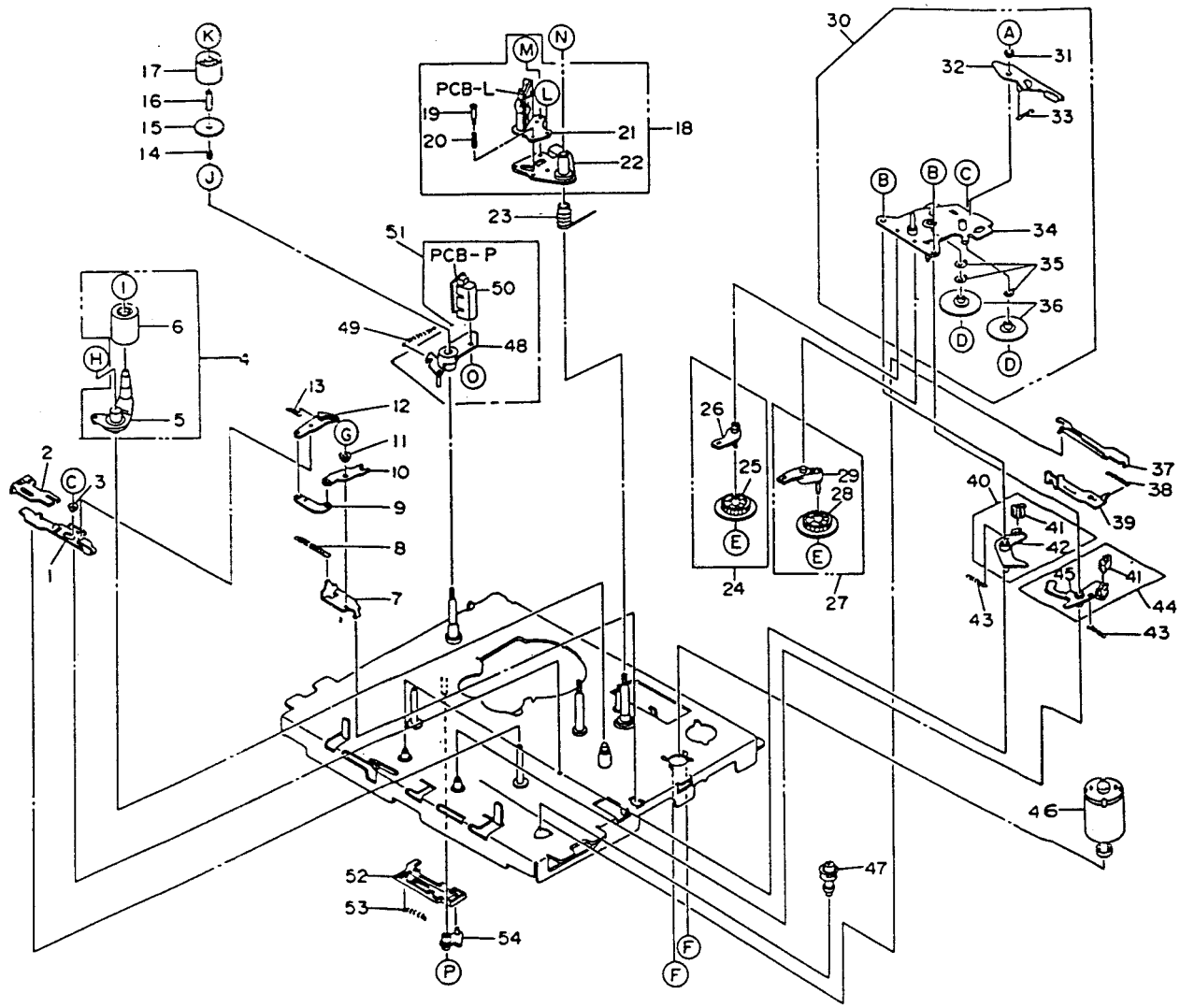
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-999-030-150	PW CUT 2.1×4×0.5	E	S9-096-000-000	TAMS SCREW 2.6×4	I	S9-999-060-000	NYLON WASHER 2.92×5×0.5
B	S9-876-000-000	PW CUT 2.1×5×0.5	F	S9-912-000-000	PW 3.1×6×0.5	J	S9-884-000-000	PW 2.5×6×0.5CUT
C	S9-191-000-000	C TAPPING SCREW 2.6×4	G	S9-105-000-000	TAMS SCREW 3×4			
D	S9-453-000-000	NUT 3.0	H	S9-495-000-000	C TAPPING SCREW 2.6×8			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	3-1	*S8-059-090-200	BT ACTUATE PLATE SPRING		1
	3-2	*S8-059-103-240	S SOFT BRAKE ASSY		1
	3-3	*S8-059-100-220	S SOFT BRAKE SPRING		1
	3-4	*S8-059-080-170	BAND HOLDER SPRING		1
	3-5	*S8-059-083-220	BT BAND ASSY		1
	3-6	*S8-059-080-150	BAND HOLDER COLLAR		1
	3-7	*S8-059-085-210	BT ARM SEMI ASSY		1
	3-8	*S8-059-080-290	BACK TENSION SUPPORT		1
	3-9	*S8-059-020-230	DAMPER RUBBER		1
	3-10	*S8-059-020-290	TRACKING ADJUSTER		1
	3-11	*S8-059-020-260	TAPE GUIDE SPRING		1
	3-12	*S8-000-030-290	TAPE GUIDE FLANGE D		1
	3-13	*S8-000-030-140	TAPE GUIDE		1
	3-14	*S8-000-030-280	TAPE GUIDE FLANGE C		1
	3-15	*S8-000-030-190	GUIDE CAP		1
	3-16	*S8-059-023-010	OPEN ANGLE ASSY		1
	3-17	*S6-808-080-040	DEW SENSOR EYH-S10R		1
	3-18	*S8-059-100-100	BRAKE ACTUATE BASE SPRING		1
	3-19	*S8-059-100-090	BRAKE ACTUATE BASE		1
	3-20	*S8-059-100-110	BRAKE PLATE		1
	3-21	*S8-059-100-120	BRAKE PLATE SPRING		1
	3-22	*S8-059-100-130	TRIGGER LEVER		1
	3-23	*S8-059-100-140	TRIGGER HOOK		1
	3-24	*S8-059-100-230	TRIGGER LEVER SPRING		1
	3-25	S8-059-053-010	REEL ASSY		2
	3-26	*S8-059-170-100	RG SLIDE PLATE COLLAR		1
	3-27	*S8-059-170-030	RG SLIDE PLATE		1
	3-28	*S8-059-170-110	RG SLIDE SPRING		1
	3-29	*S8-059-170-090	RG SLIDE BASE		1
	3-30	*S8-059-073-010	METAL HOUSING ASSY		1
	3-31	*S8-059-175-020	RG ARM SEMI ASSY		1
	3-32	S8-059-073-020	CAPSTAN MOTOR ASSY		1

EXPLODED VIEW – 4

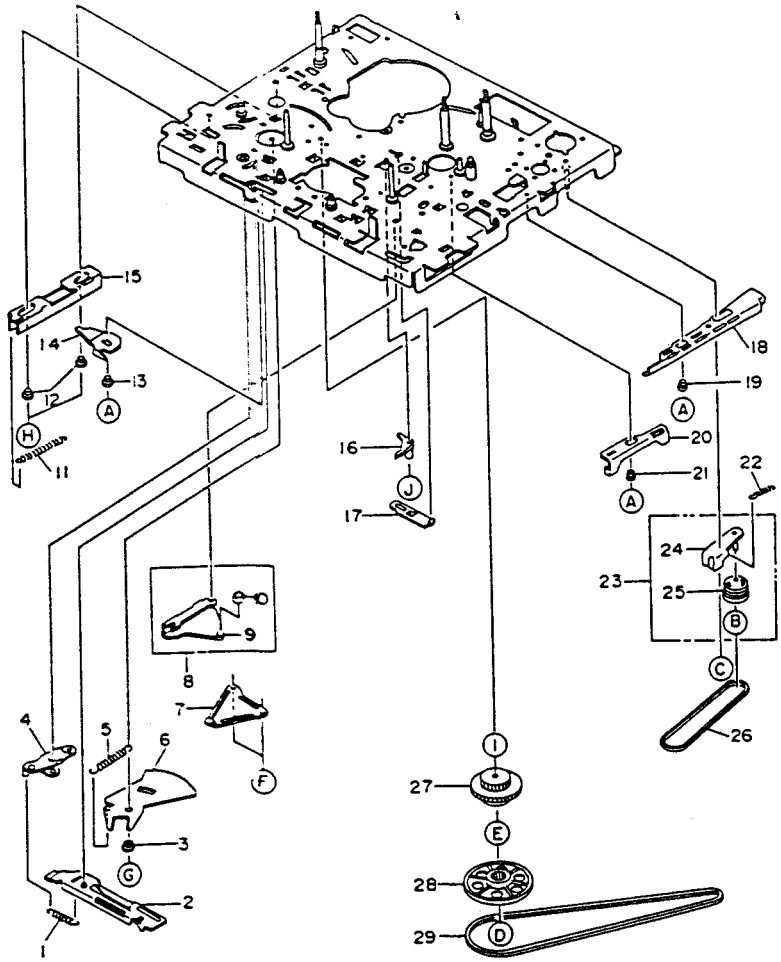
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-974-000-000	SL FH SCREW 2×3	G	S9-096-000-000	TAMS SCREW 2.6×4	M	S9-705-000-000	LONG LOCK SCREW 2.6×7
B	S9-097-000-000	TAMS SCREW 2×4	H	S9-999-030-000	PW CUT 5×8×0.5	N	S9-953-000-000	NYLON NUT M3
C	S9-192-000-000	C TAPPING SCREW 2.6×5	I	S9-038-000-000	SCREW 2.6×4	O	S9-953-000-000	SCREW FLANGE 2×3
D	S9-500-000-000	E RING S1.5	J	S9-387-000-000	PLANE WASHER 3×8×0.5	P	S9-876-000-000	PW 2.1×5×0.5CUT
E	S9-743-000-000	PW CUT 1.5×3.8×0.3	K	S9-953-000-000	NYLON NUT M3			
F	S9-105-000-000	C TAPPING SCREW 3×4	L	S9-999-000-250	SCREW 3.6 (SHAPE TYPE)			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	4-1	*S8-059-060-240	P SLIDE PLATE A		1
	4-2	*S8-059-060-250	P SLIDE PLATE B		1
	4-3	*S8-059-060-180	COLLAR		1
	4-4	S8-059-063-010	PINCH ROLLER ARM ASSY		1
	4-5	*S8-059-065-010	PINCH ROLLER ARM SEMI ASSY		1
	4-6	S8-000-090-220	PINCH ROLLER A		1
	4-7	*S8-059-060-190	P ANGLE HOLDER		1
	4-8	*S8-059-060-200	P-SPRING,ROLLER		1
	4-9	*S8-059-060-060	JOINT PLATE		1
	4-10	*S8-059-060-050	P ACTUATE ANGLE		1
	4-11	*S8-059-060-180	COLLAR		1
	4-12	*S8-059-060-040	P ACTUATE ARM		1
	4-13	*S8-059-060-090	P-SPRING,ACTUATE ARM		1
	4-14	*S8-059-040-090	TAPE GUIDE FLANGE SPRING		1
	4-15	*S8-059-040-070	TAPE GUIDE FLANGE A		1
	4-16	*S8-059-040-060	IMPEDANCE ROLLER SLEEVE		1
	4-17	*S8-059-040-050	IMPEDANCE ROLLER		1
	4-18	*S8-059-043-080	HEAD BASE ASSY		1
	4-19	---	AZIMUTH SPRING SCREW		1
	4-20	---	AZIMUTH SPRING		1
	4-21	S6-204-150-060	ACE HEAD HV225211		1
	4-22	---	HEAD BASE SEMI ASSY		1
	4-23	---	HEAD SPRING		1
	4-24	*S8-059-093-140	P GEAR ASSY		1
	4-25	---	PLAY GEAR		1
	4-26	*S8-059-093-030	P GEAR ARM ASSY		1
	4-27	*S8-059-093-150	RF GEAR ASSY		1
	4-28	---	FF GEAR		1
	4-29	*S8-059-093-040	RF GEAR ARM ASSY		1
	4-30	*S8-059-093-160	SUB PLATE ASSY		1
	4-31	*S8-059-100-070	T SOFT BRAKE ARM COLLAR		1
	4-32	*S8-059-103-030	T SOFT BRAKE ASSY		1
	4-33	*S8-059-100-060	T-SPRING,SOFT BRAKE ARM		1
	4-34	---	SUB PLATE SEMI ASSY		1
	4-35	*S8-000-100-250	WAVE WASHER		3
	4-36	*S8-059-090-6A0	REEL DRIVE GEAR		2
	4-37	*S8-059-100-160	BRAKE LIFTER		1
	4-38	*S8-059-100-180	L BRAKE ACTUATOR SPRING		1
	4-39	*S8-059-100-170	L BRAKE ACTUATOR		1
	4-40	*S8-059-103-010	S BRAKE ARM ASSY		1
	4-41	*S8-059-100-190	BRAKE SHOE		2
	4-42	*S8-059-100-010	S BRAKE ARM		1
	4-43	*S8-059-100-020	BRAKE ARM SPRING		2
	4-44	*S8-059-103-020	T BRAKE ARM ASSY		1
	4-45	*S8-059-100-030	T BRAKE ARM		1
	4-46	S8-059-113-010	LM ASSY		1
	4-47	*S8-059-113-020	TRIGGER BEARING ASSY		1
	4-48	---	FE PLATE		1
	4-49	*S8-059-040-080	FE PLATE SPRING		1
	4-50	*S6-204-150-030	FE HEAD HVFMD 0006		1
	4-51	*S8-059-043-020	FE PLATE ASSY		1
	4-52	*S8-059-040-100	FE SLIDE PLATE		1
	4-53	*S8-059-040-120	FE ACTUATE SPRING		1
	4-54	*S8-059-040-110	FE ACTUATE LEVER		1

EXPLODED VIEW – 5

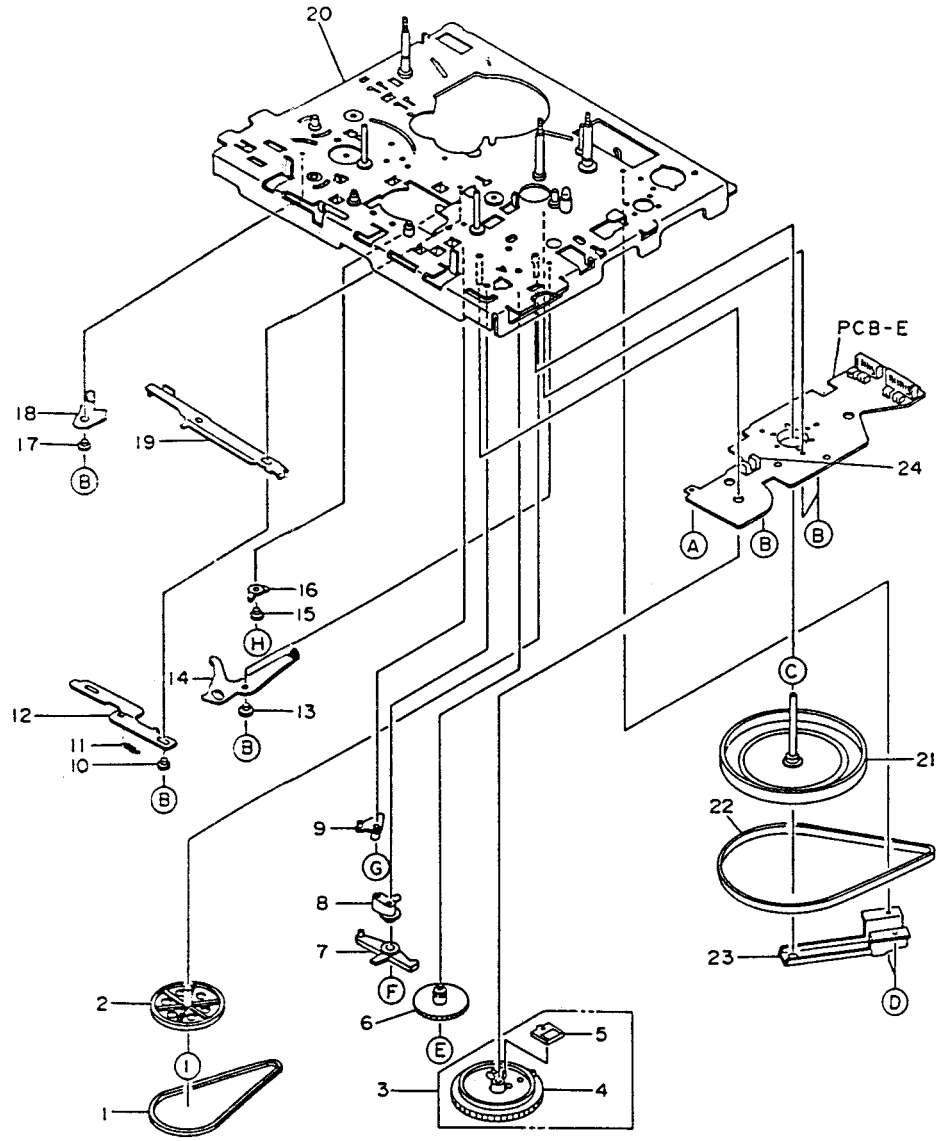
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-192-000-000	C TAPPING SCREW 2.6×5	E	S9-999-060-040	NYLON WASHER 2.98×6×0.3	I	S9-853-000-000	NYLON WASHEER 3.1×6×0.3
B	S9-743-000-000	PW CUT 1.6×3.8×0.5	F	S9-078-000-000	TAMS SCREW 2×5	J	S9-876-000-000	PW CUT 2.1×5×0.5
C	S9-876-000-000	PW CUT 2.1×6×0.5	G	S9-203-000-000	C TAPPING SCREW 3×6			
D	S9-884-000-000	PW CUT 2.6×6×0.5	H	S9-840-000-000	S TAPPNG SCREW 2.6×3.5			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	5-1	★S8-059-120-050	LOADING ACTUATOR SPRING		1
	5-2	★S8-059-125-030	LOADING ACTUATOR SEMI ASSY		1
	5-3	★S8-059-120-100	L GEAR PLATE COLLAR		1
	5-4	★S8-059-125-020	LOADING ACTUATE LEVER SEMI ASSY		1
	5-5	★S8-059-120-120	L GEAR PLATE SPRING		1
	5-6	★S8-059-120-090	L GEAR PLATE		1
	5-7	★S8-059-120-110	LOADING LEVER REINFORCE PLATE		1
	5-8	★S8-059-123-010	LOADING LEVER ASSY		1
	5-9	---	LOADING LEVER SEMI ASSY		1
	5-10	---	CAM ROLLER		1
	5-11	★S8-059-080-130	BACK TENSION SPRING		1
	5-12	★S8-059-080-210	BT ACTUATE PLATE COLLAR		2
	5-13	★S8-059-060-180	COLLAR		1
	5-14	★S8-059-080-180	BT ACTUATE LEVER		1
	5-15	★S8-059-060-190	BT ACTUATE PLATE		1
	5-16	★S8-059-170-010	RG ACTUATE ARM		1
	5-17	★S8-059-170-020	RG ACTUATE		1
	5-18	★S8-059-150-070	L BRAKE PLATE		1
	5-19	★S8-059-060-160	COLLAR		1
	5-20	★S8-059-150-080	EJECT ACTUATOR		1
	5-21	★S8-059-060-180	COLLAR		1
	5-22	★S8-059-150-110	IDLER ARM SPRING		1
	5-23	★S8-059-153-030	E IDLER ARM ASSY		1
	5-24	---	E IDLER ARM SEMI ASSY		1
	5-25	---	EJECT PULLEY		1
	5-26	S8-059-150-060	FL BELT		1
	5-27	★S8-059-093-100	CLUTCH ASSY		1
	5-28	★S8-059-093-010	MIDDLE PULLEY ASSY		1
	5-29	★S8-059-090-170	DRIVE BELT		1

EXPLODED VIEW – 6

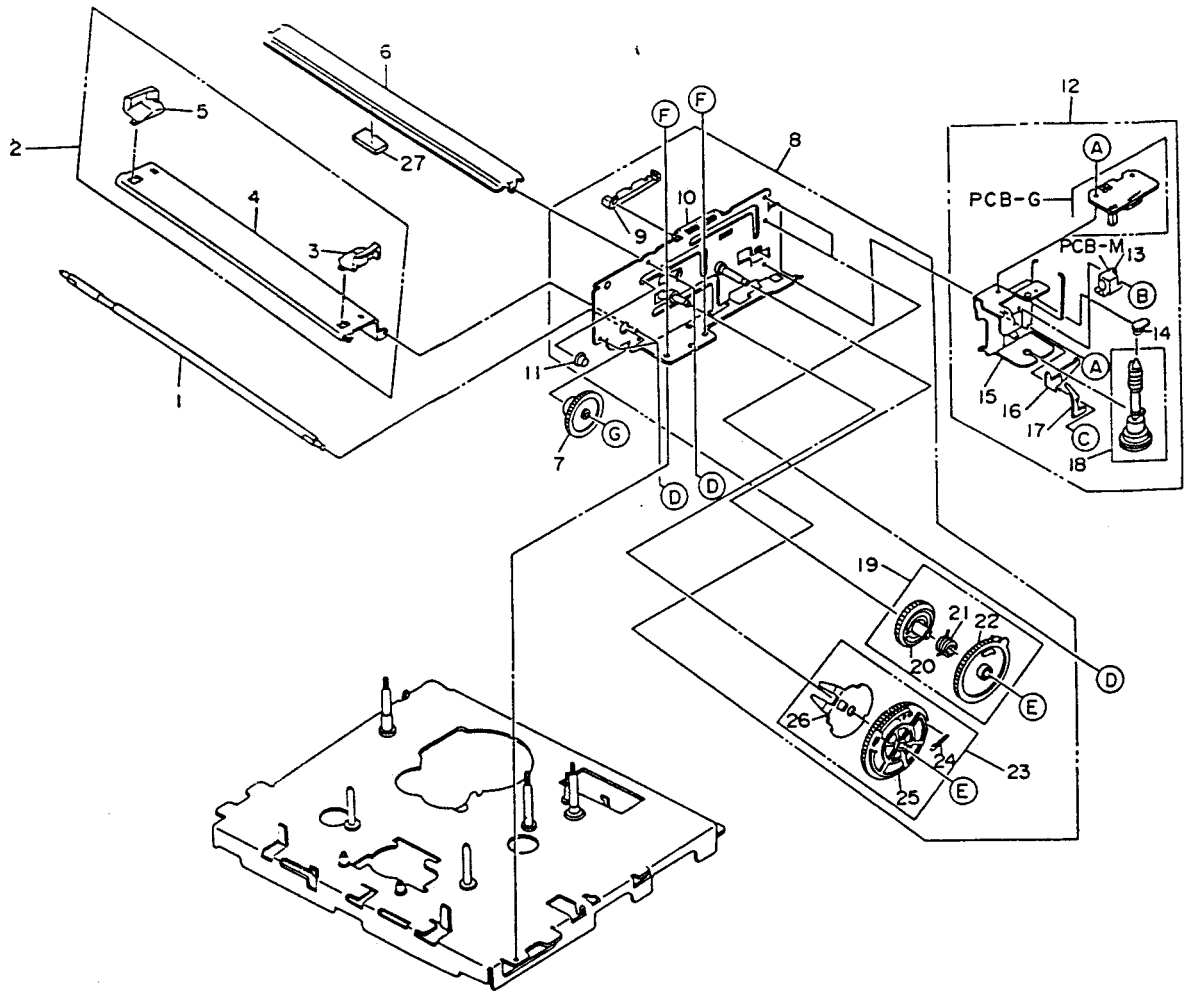
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-671-000-000	S TAPPING SCREW 2.6×5	D	S9-202-000-000	C TAPPING SCREW 3×5	G	S9-884-000-000	PW CUT 2.6×6×0.5
B	S9-192-000-000	C TAPPING SCREW 2.6×5	E	S9-876-000-000	PW CUT 2.1×5×0.5	H	S9-999-180-100	C TAPPING FH SCREW 2.6×4
C	S9-912-000-000	PW 3.1×6×1.5	F	S9-999-030-100	PW CUT 2.6×8×0.5	I	S9-743-000-000	PW CUT 1.5×3.8×0.3



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	6-1	S8-059-110-060	LOADING BELT		1
	6-2	*S8-059-110-030	LOADING PULLEY		1
	6-3	*S8-059-113-030	LOADING CAM ASSY		1
	6-4	---	LOADING CAM		1
	6-5	---	S BRUSH		1
	6-6	*S8-059-110-040	LOADING GEAR		1
	6-7	*S8-059-110-140	EJECT ARM		1
	6-8	*S8-059-110-130	BRAKE ACTUATE ARM		1
	6-9	*S8-059-110-120	SEARCH ARM B		1
	6-10	*S8-059-060-110	P SLIDER COLLAR		1
	6-11	*S8-059-060-230	P-SPRING,SLIDER		1
	6-12	*S8-059-060-100	P SLIDER		1
	6-13	*S8-059-060-170	P CAM LEVER COLLAR		1
	6-14	*S8-059-065-020	P CAM LEVER SEMI ASSY		1
	6-15	*S8-059-060-130	P CRANK COLLAR		1
	6-16	*S8-059-060-120	P CRANK		1
	6-17	*S8-059-060-180	COLLAR		1
	6-18	*S8-059-080-230	BT RETURN LEVER		1
	6-19	*S8-059-080-100	BT CHANGE PLATE		1
	6-20	---	CHASSIS SEMI ASSY		1
	6-21	*S8-059-070-140	FLYWHEEL CAPSTAN		1
	6-22	S8-059-070-100	MAIN BELT		1
	6-23	*S8-059-073-030	FL ANGLE ASSY		1
	6-24	S6-808-080-030	REEL SENSOR		1

EXPLODED VIEW – 7

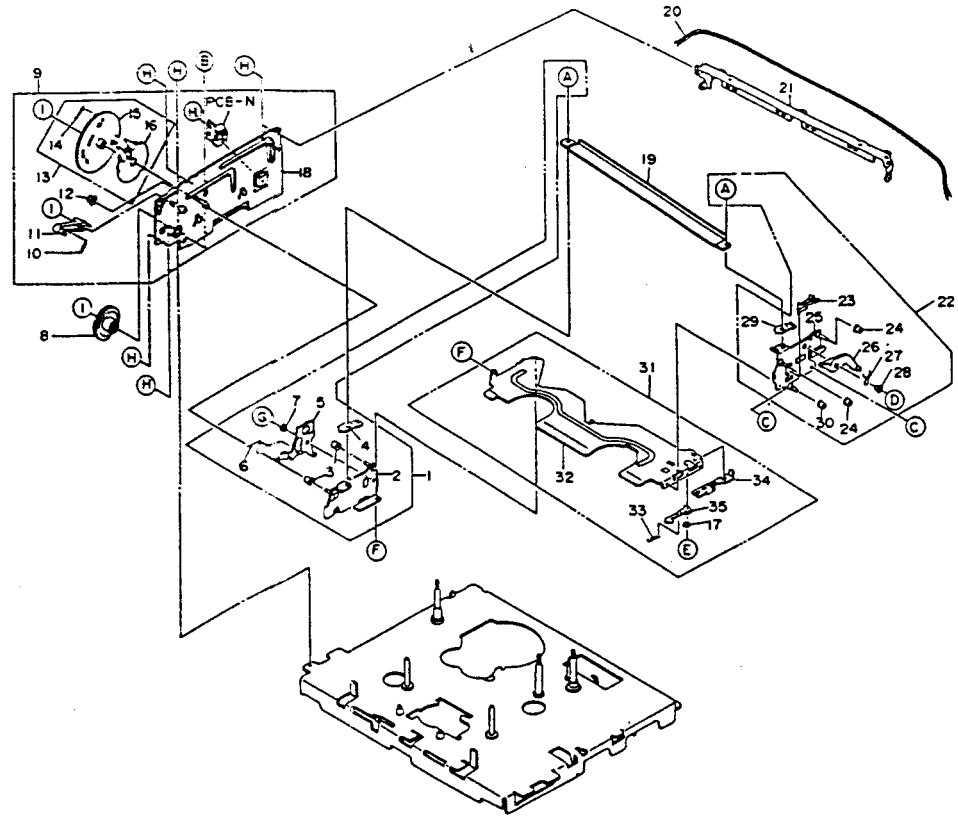
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-096-000-000	TAMS SCREW 2.6×4	D	S9-096-000-000	TAMS SCREW 2.6×4	G	S9-504-000-000	E RING S2.5
B	S9-078-000-000	TAMS SCREW 2×5	E	S9-504-000-000	E RING S2.5			
C	S9-743-000-000	PW CUT 1.6×3.5×0.3	F	S9-192-000-000	C TAPPING SCREW 2.6×4			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	7-1~8-35	*S8-059-163-170	FRONT LOADING ASSY		1
	7-1	*S8-059-160-600	SYNCHRONIZE SHAFT		1
	7-2	---	FRONT ANGLE ASSY		1
	7-3	*S8-059-160-250	TAPE GUIDE R		1
	7-4	*S8-059-160-180	FRONT ANGLE		1
	7-5	*S8-059-160-240	TAPE GUIDE L		1
	7-6	*S8-059-160-660	UPPER PLATE		1
	7-7	*S8-059-160-170	SYNCHRONIZE GEAR A		2
	7-8	*S8-059-163-390	FRAME R ASSY		1
	7-9	---	OPEN LEVER GUIDE		1
	7-10	---	FRAME R SEMI ASSY		1
	7-11	---	GUIDE SLEEVE		1
	7-12	*S8-059-163-180	C LOAD BRACKET ASSY		1
	7-13	---	SENSOR P.C.B RM ASSY		1
	7-14	---	F WORM BEARING A		1
	7-15	---	C LOAD BRACKET SEMI ASSY		1
	7-16	---	IN SW LEVER		1
	7-17	---	S SW LEVER		1
	7-18	*S8-059-163-190	F LOADING CLUTCH ASSY		1
	7-19	*S8-059-163-210	WORMWHEEL ASSY		1
	7-20	---	FRICTION GEAR		1
	7-21	---	FRICTION SPRING		1
	7-22	---	WORMWHEEL		1
	7-23	*S8-059-163-120	LIFT GEAR R ASSY		1
	7-24	---	LP SPRING		1
	7-25	---	LIFT GEAR R		1
	7-26	---	LIFT ARM		1
	7-27	*S8-059-160-720	DAMPER MAT		1

EXPLODED VIEW – S

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-833-000-000	SCREW 2.3×2	D	S9-967-000-000	SL SCREW 2×4	G	S9-966-000-000	SL SCREW 2×2.5
B	S9-192-000-000	C TAPPING SCREW 2.6×4	E	S9-968-000-000	SL SCREW 2.6×3	H	S9-096-000-000	TAMS SCREW 2.6×4
C	S9-556-000-000	SCREW 2.6×3	F	S9-991-000-000	SCREW 2.3×2.5	I	S9-504-000-000	E RING S2.5



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	7-1~8-35	*S8-059-163-170	FRONT LOADING ASSY		1
	8-1	*S8-059-163-090	SIDE PLATE L ASSY		1
	8-2	---	SIDE PLATE L SEMI ASSY		1
	8-3	---	GUIDE ROLLER		2
	8-4	---	CASSETTE PUSH PLATE		1
	8-5	---	C LCOK PLATE L		1
	8-6	---	LOCK PLATE SPRING L		1
	8-7	---	LOCK PLATE COLLAR		1
	8-8	*S8-059-160-170	SYNCHRONIZE GEAR A		2
	8-9	*S8-059-163-380	FRAME L ASSY		1
	8-10	*S8-059-160-680	LIFT LEVER SPRING		1
	8-11	*S8-059-160-670	LIFT LEVER		1
	8-12	---	GUIDE SLEEVE		1
	8-13	*S8-059-163-140	LIFT GEAR L ASSY		1
	8-14	---	LP SPRING		1
	8-15	---	LIFT GEAR L		1
	8-16	---	LIFT ARM		1
	8-17	---	COLLAR		1
	8-18	---	FRAME L SEMI ASSY		1
	8-19	*S8-000-220-650	TOP STAY		1
	8-20	---	END SENSOR WIRE		1
	8-21	*S8-059-160-090	REAR ANGLE		1
	8-22	*S8-059-163-080	SIDE PLATE R ASSY		1
	8-23	---	LOCK RELEASE LEVER		1
	8-24	---	GUIDE ROLLER		2
	8-25	---	SIDE PLATE R SEMI ASSY		1
	8-26	*S8-000-220-250	OPEN LEVER		1
	8-27	---	OPEN LEVER SPRING		1
	8-28	---	OPEN LEVER COLLAR		1
	8-29	---	CASSETTE PUSH PLATE		1
	8-30	---	GUIDE ROLLER		1
	8-31	*S8-059-163-060	CASSETTE HOLDER ASSY		1
	8-32	---	CASSETTE HOLDER		1
	8-33	---	LOCK SPRING		1
	8-34	---	SLIDE PLATE		1
	8-35	---	C LOCK PLATE A		1

■ ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	1	★ 80-JUB-901-010	INSTRUCTION BOOKLET, H (SH)	※	1
	1	★ 80-JUB-902-010	INSTRUCTION BOOKLET, H (DE,RU)	※	1
	2	★ 87-034-593-010	CORD,RF PAL		1
	3	★ 87-034-755-010	AC CORDSET ASSY,E		1
	4	★ 80-JUB-666-010	REMOTE UNIT,RC-TM10		1